

A
**NEW WORLD
DISCOVERED**

—BY O. F. BAROUS, B.Sc.—

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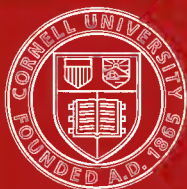
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A
NEW WORLD DISCOVERED.

Mr. O. F. BARCUS,

7 Barchet Road,

Shanghai,

CHINA.

RECORD OF PERSONAL OBSERVATIONS.

No.....

(NOTE :—In making observations one should choose a point from which an unobstructed view of objects may be had over two or three miles of water. Large bodies of comparatively still smooth water like the Grand Canal furnish excellent fields for observation ; although rivers like the great Yangtze are very satisfactory. It must not be thought, however, that the phenomena cannot be successfully observed from high as well as very low elevations. The width of the superscene, or mirror-like space above the apparent horizon, increases the lower the elevation ; but it is obviously not so convenient to get in a position to observe with the eye only a few inches above the surface of the water.

In the following remarks, some details of the observations should be noted : such as, conditions of weather and of the water's surface, time of day, position of sun, distance of apparent horizon, elevation of eye, optical instruments used, etc. Any comments or criticisms—the more severe, the better—are earnestly solicited. All such records of personal observations of the earth's surface will be gratefully received, and will be used in presenting the wonderful Truth which they reveal.

Other phenomena doubtless have been seen by many persons who have not reflected on their significance : such as, the mirage, the bringing into view by the use of a large telescope vessels or other objects that are supposed to have passed into invisibility beyond and below the apparent horizon, etc. All accounts of such observations will be gratefully received.)

O. F. BARCUS,
7 BARCHET ROAD, SHANGHAI, CHINA.

Dear Sir :—

I have read your book entitled “ A New World Discovered.” and have made some of the observations suggested. On....., at....., I observed the following
(date) (place)
phenomena and declare this to be a true and authentic record of same.

(Signed).....

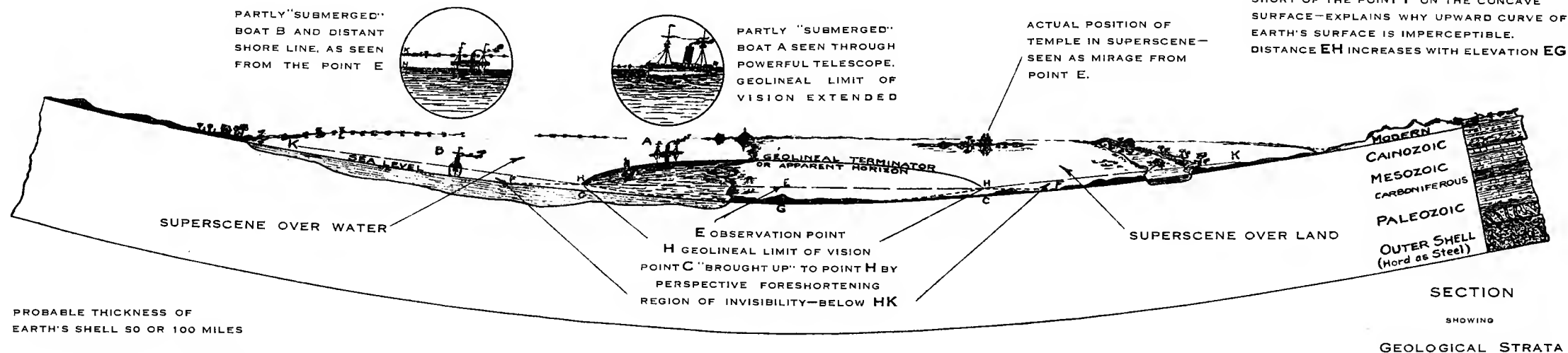
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Additional Witnesses :
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PHENOMENA EXPLAINED ON CONCAVE SURFACE

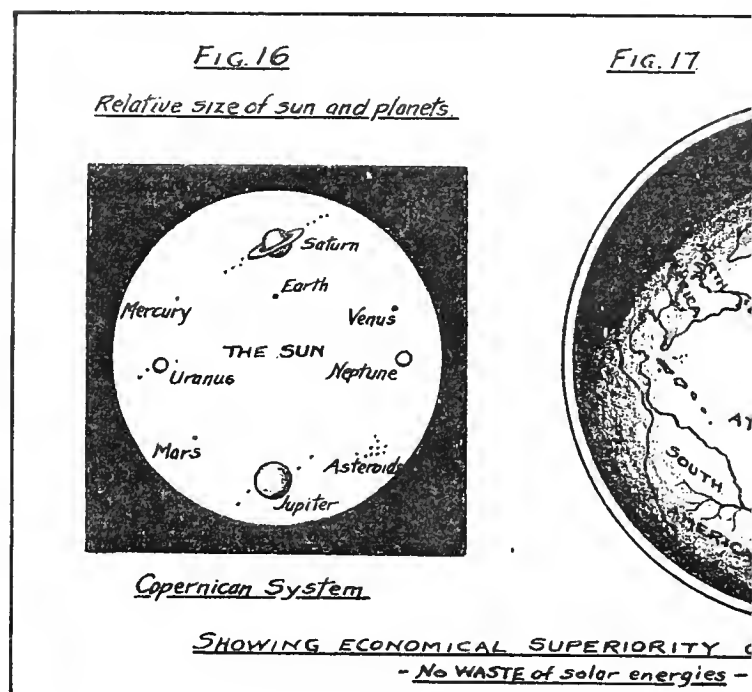
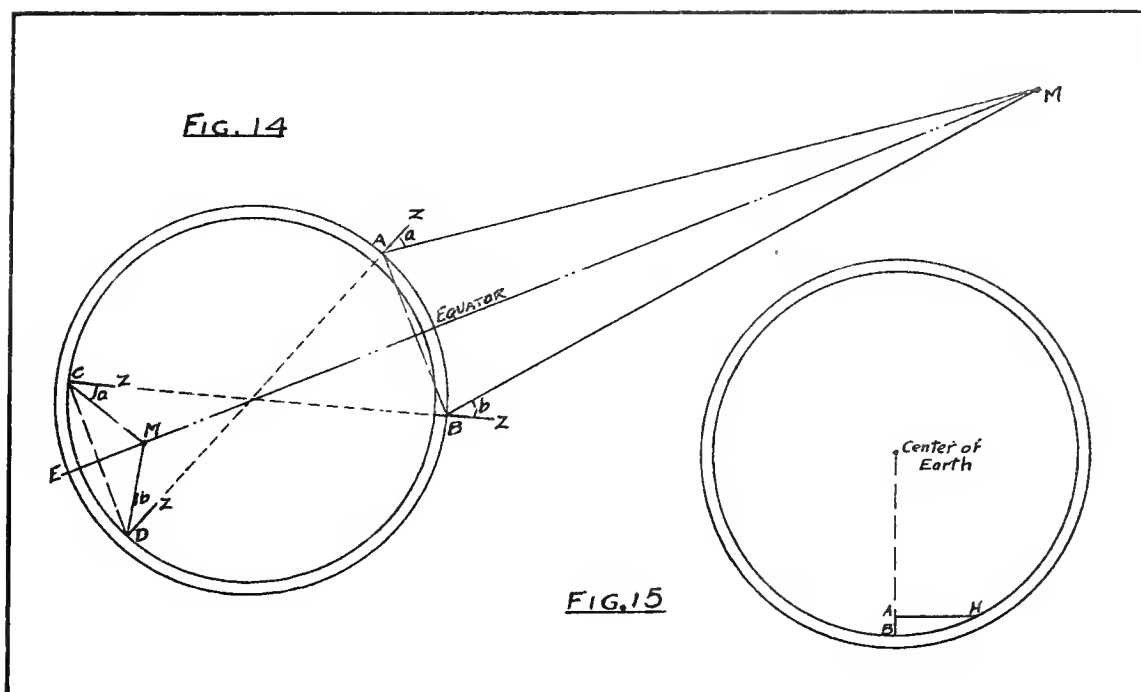
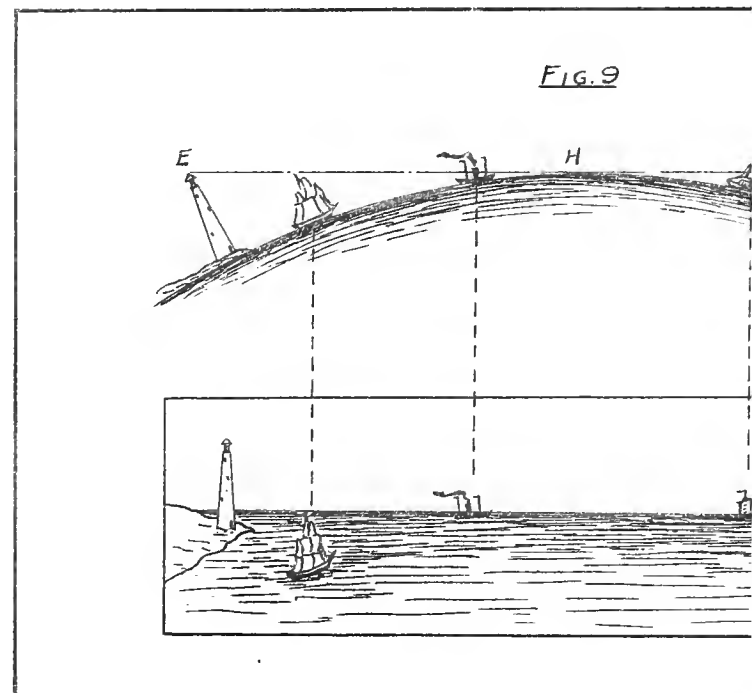
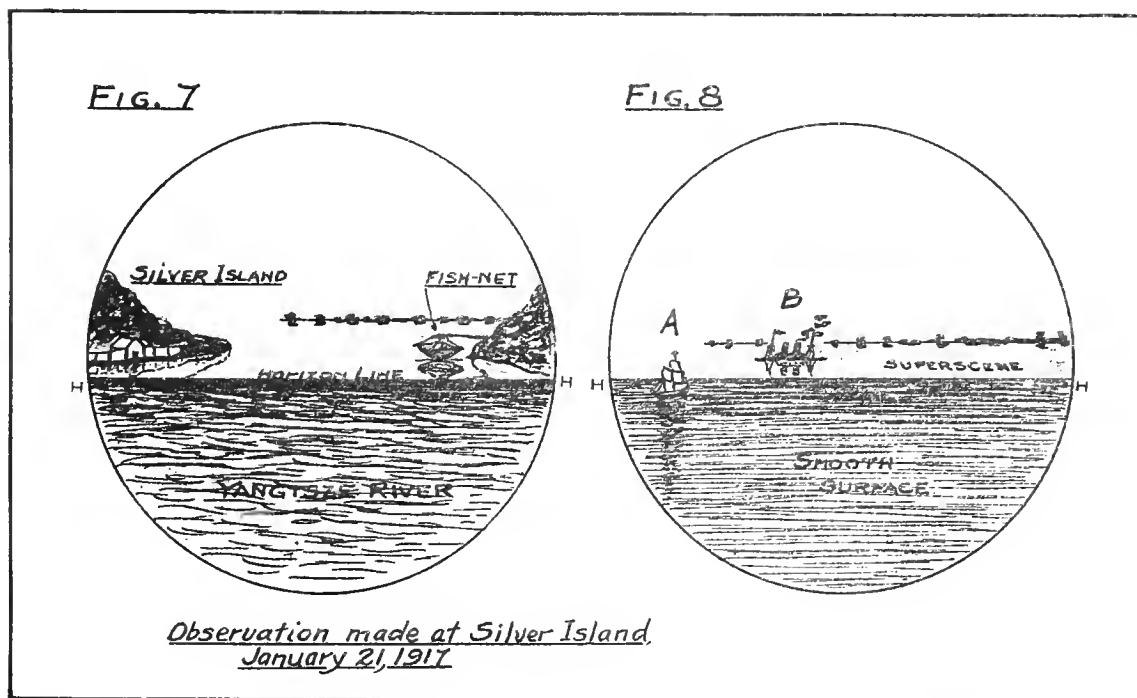
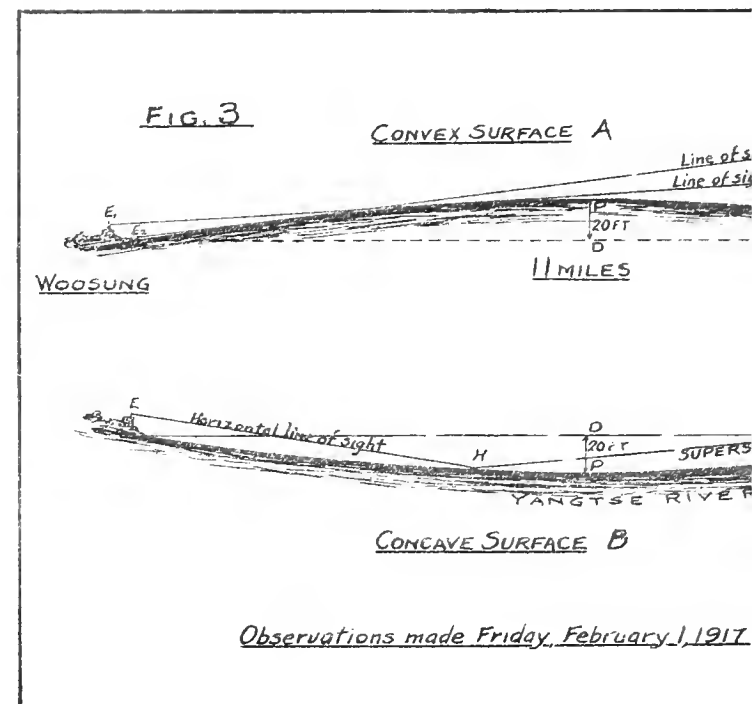
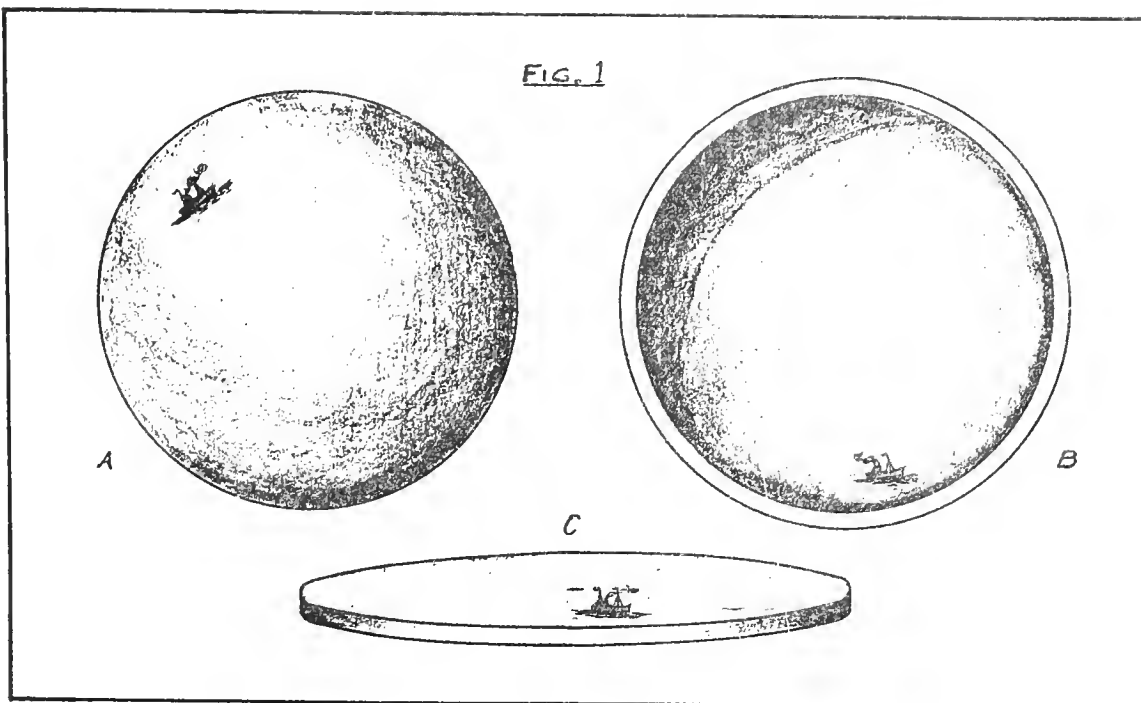
UNEXPLAINABLE ON CONVEX SURFACE

Fig. 25



CONCAVE ARC (AND LIKEWISE SUPERSCENE) NECESSARILY GREATLY EXAGGERATED.

IF DRAWN TO TRUE SCALE, CORRESPONDING TO ELEVATION EG THE DIAGRAM WOULD EXTEND 40 FEET EACH WAY FROM THE POINT G



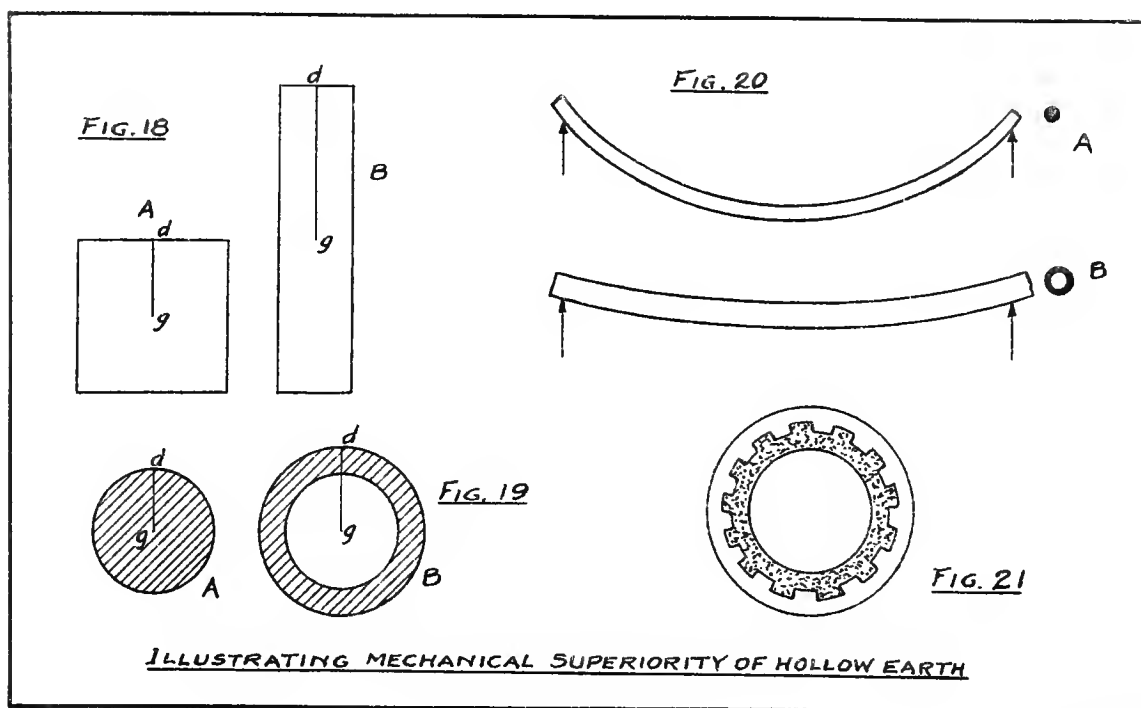
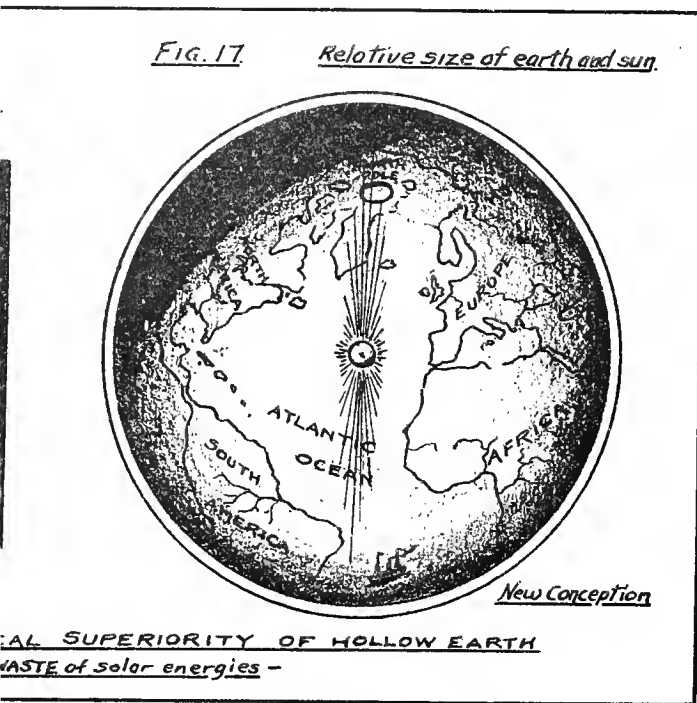
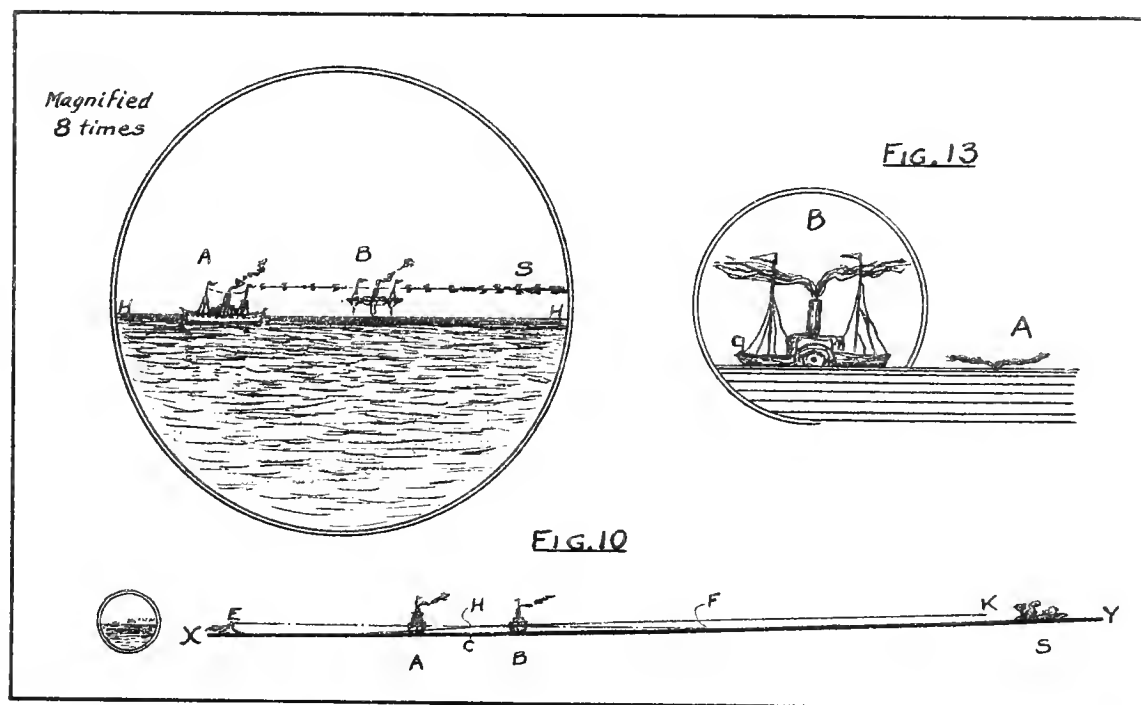
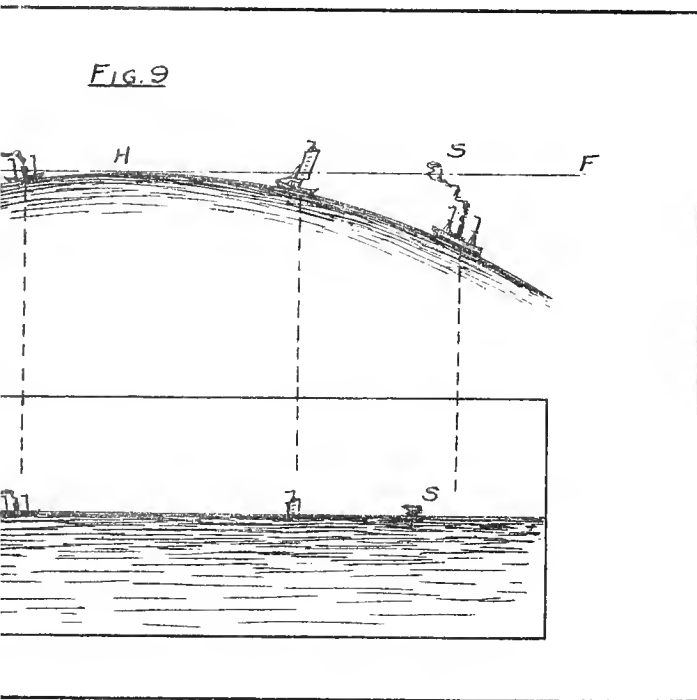
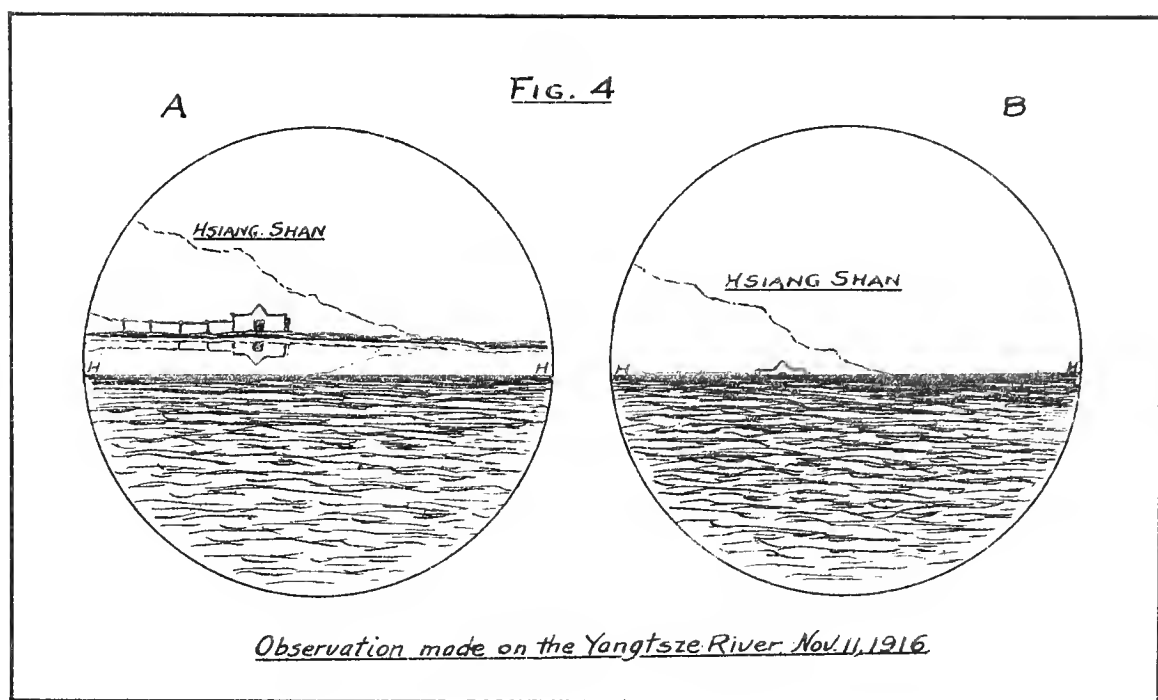
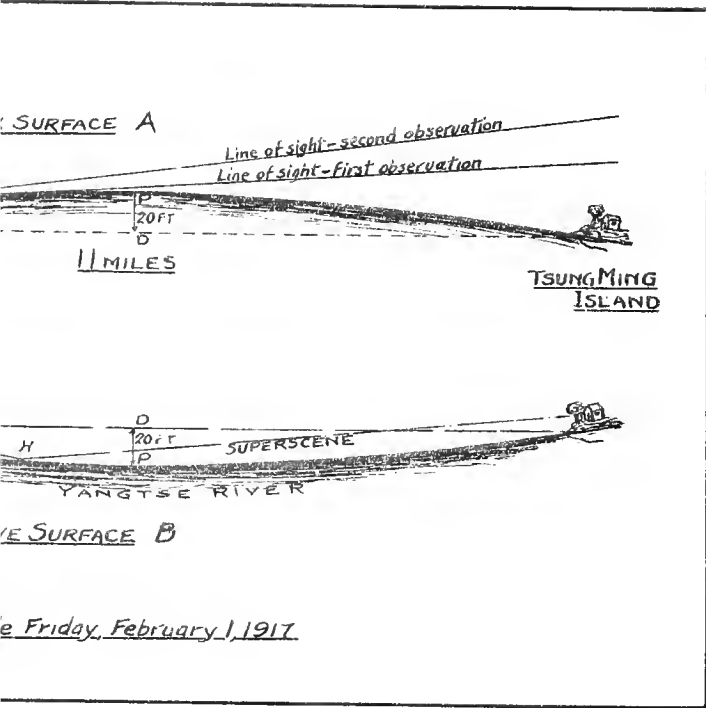
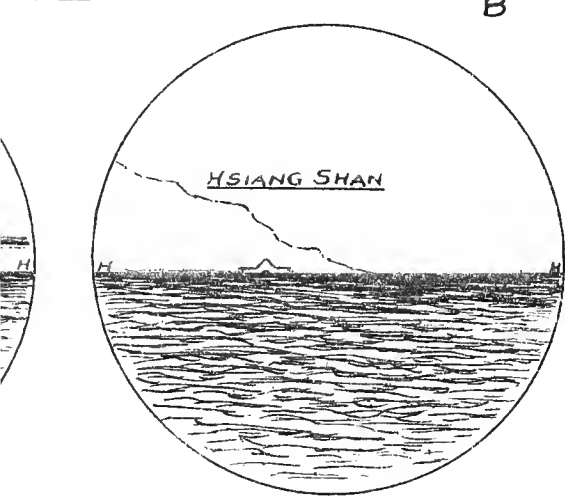


FIG. 4



on the Yangtze River Nov. 11, 1916.

FIG. 5

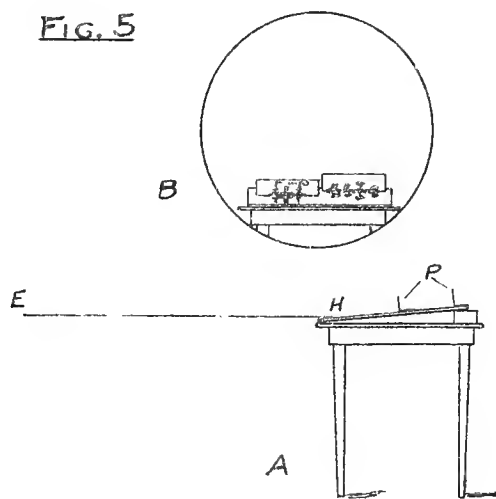


FIG. 6

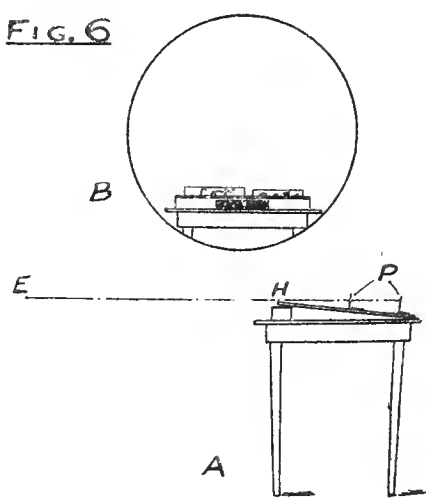


FIG. 13

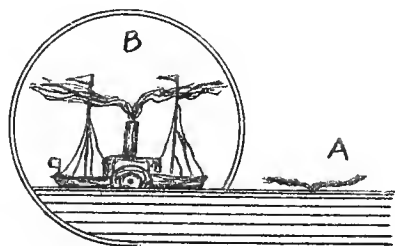


FIG. 10



FIG. 11

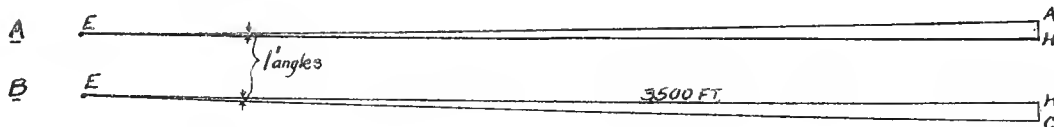


FIG. 12

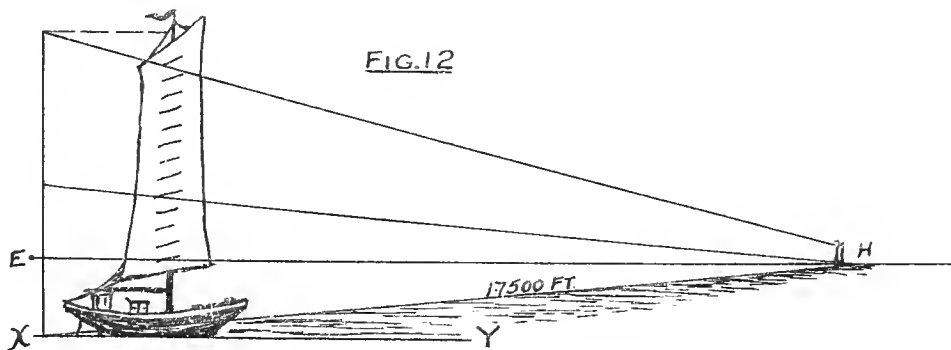
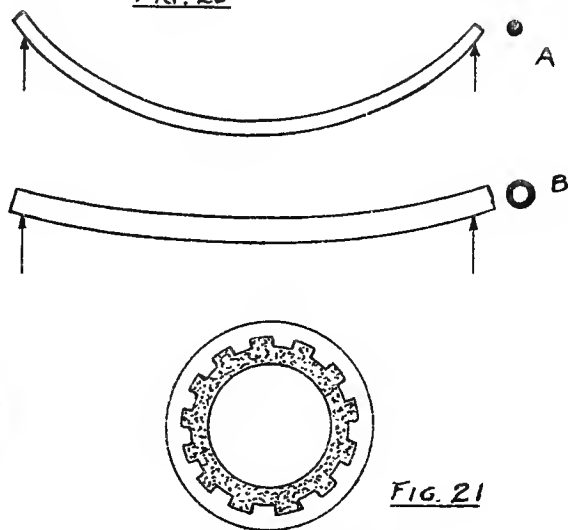


FIG. 20



SUPERIORITY OF HOLLOW EARTH

FIG. 23

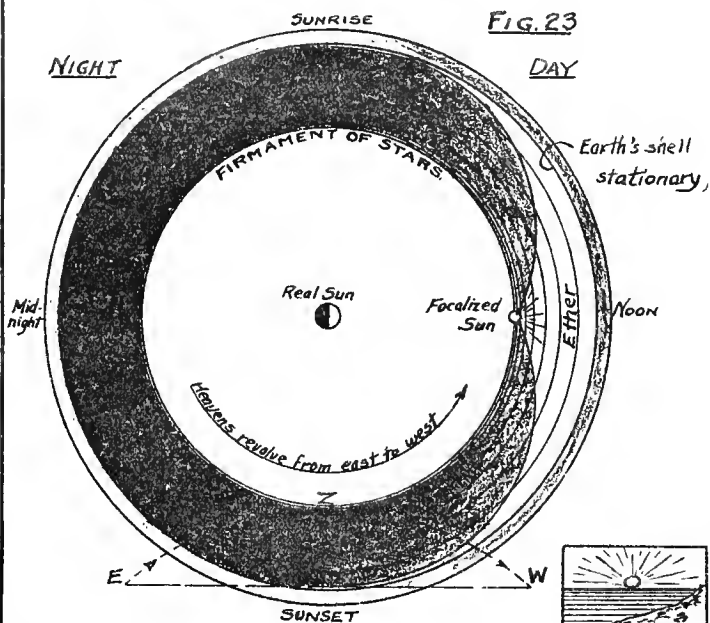
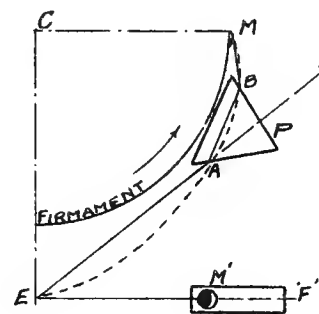


FIG. 24



CAUSE OF DAY AND NIGHT

A
NEW WORLD
DISCOVERED

"Columbus discovered only half a world; in this book the reader is invited to participate in the discovery of an entirely New World. Paul, the Apostle, 'turned the world upside down,' figuratively speaking, with his new Gospel of Truth; but the new conception of Truth presented in this book literally 'turns the world inside out!'"

BY

O. F. BARCUS, B.Sc.

PUBLISHERS:

KELLY & WALSH, LIMITED,
SHANGHAI—HONGKONG—YOKOHAMA—SINGAPORE

1917

To

A very Dear Friend
whose Christian life and character
inspired me to embark on this wonderful
Voyage of Discovery.

"There is a place for speculation and imagination in the scientific method, but it is a place apart, which must be shut off, for if speculations are not kept in strict quarantine they are certain to infect our conceptions with their own fatal vagueness."—*Mill in "Realm of Nature."*

"It is probable that in the future, as in the past, the greatest discoveries, those which will suddenly reveal totally unknown regions, and open up entirely new horizons, will be made by a few scholars of genius who will carry on their patient labor in solitary meditation, and who, in order to verify their boldest conceptions, will no doubt content themselves with the most simple and least costly experimental apparatus."—*Poincare in "The New Physics," 1915.*

"The governing passion in the life of the man of science is his passion for beauty. The soul of science, for the extension and embellishment of which scientific men live their lives, is the scientific theory. They do not live to invent aeroplanes, to discover wireless telegraphy, to build Zeppelins and concoct poisons, but To See the Universe as a more Comprehensive and more Harmonious Whole, and their reward is the acute aesthetic pleasure which the discovery of such harmony entails."—*Scientific American, December 30, 1916.*

"There are certain periods in the history of scientific progress when a discovery or group of discoveries changes the whole trend of thought. Startling as the new facts and phenomena may be, they are overshadowed by the important and far-reaching character of the ideas they suggest, and by the influence these exert in modifying views which have become almost as irrevocable as the laws of the Medes and Persians. Old mental pictures, fruitful in indicating the direction of further experiment and reasoning, are wiped out, and for a time scientific men are busy painting with tentative and hesitating strokes the new picture of the physical universe."—*Cressy in "Discoveries and Inventions," 1914.*

"If any one will take the trouble to make an examination, it will be found that the one great fundamental Fact upon which a true conception of the world is to be based is that The Earth's Surface is Concave."—*The Author.*

CONTENTS

	PAGE
Preface	I.—“The New Earth” 8
„	II.—“The New Heavens” 10
Chapter	1.—Introduction 13
„	2.—Is the Earth’s Surface Flat, Convex, or Concave? 22
„	3.—Seeing Distant Objects Over Water ... 26
„	4.—The “Wireless” Phenomenon ... 32
„	5.—The Mirage 38
„	6.—A Study in Reflections 46
„	7.—How and What to Observe 52
„	8.—The Disappearance of Vessels ... 54
„	9.—Other Phenomena 61
„	10.—“An Introduction to the New Cosmology” 64
„	11.—Conclusion 71
Appendix	A.—Cause of Day and Night 82
„	B.—“Proofs” of the Copernican system ... 84
„	C.—Seventy-Five Vital Questions ... 87
„	D.—Brief Outline History of Astronomy ... 96

PREFACE I.

"The New Earth."

This little work is put before the public as a brief introduction to what must ultimately prove to be one of the most revolutionary discoveries in the history of the human race. In presenting this discovery I make no claims to any special revelation of Truth hitherto withheld, but I do maintain that for some unaccountable reason there has been in the world of science an astonishing "marvel of oversight," in that scientific thinkers have never subjected the surface of our earth to a rigid, rational and thorough examination in order to ascertain its true contour. Thousands upon thousands of careful and painstaking observations of the **heavenly bodies** and of their movements have been made with powerful telescopes, ingenious spectroscopes, and with many other instruments,—the best and most accurate that human ingenuity could devise ; yet, when we come to look for records of equally careful and painstaking examinations of **the earth's surface**, we fail to find any, for the simple reason that no such examinations have ever been made,—or, if they have, the scientific world, and hence the public in general, has never had the benefits of them.

I have done what any normally intelligent person would have done, had the thought occurred to him : refusing to accept for granted all the teaching of our modern scientific text-books

concerning the nature of the universe, I have made a series of observations of various phenomena at the earth's surface itself, more especially over bodies of water where a better study of the phenomena may be carried on. The results of these observations are briefly set forth in this volume. The edition is necessarily a limited one, since I am preparing a fuller treatment of the whole subject matter for publication within the next year. An outline of the work presented in this larger edition is given on page 64.

Meanwhile I am preparing an article to be published in one of the leading scientific magazines, and am therefore very desirous of multiplying my own personal evidence by that of others, who, being sufficiently persuaded that the idea is something more than farcical, or ephemeral (like so many others that have gone before), are willing to make the observations herein suggested and furnish me with a record of same. Each reader therefore is given an opportunity of sharing in the presentation of this new conception of our earth, by making personal observations of the phenomena,—or of some of them, at least,—and forwarding to me the records on the accompanying blank duly filled in and signed. All such records will be gratefully received, and will be used as so much additional evidence in the presenting of the wonderful Truth which they reveal.

PREFACE II.

"The New Heavens."

I began this work with the intention of saying very little about the probable structure of "the new heavens" as related to "the new earth"; since the rigid principle upon which I base my arguments for a hollow earth requires that all evidence, of whatsoever kind, obtained from observations of celestial phenomena shall be considered as secondary—decidedly so—to the one great fundamental fact, namely : that **the earth's surface is concave**. Our previous conception of the probable structure of the heavens must undergo such a revolutionary change, when viewed in the light of this new fact, that it would require many more pages of illustrations and explanations to satisfy the host of critical minds in the vast number of questions that would arise.

It required years and years of patient labor on the part of hundreds of brilliant minds to arrive at the present conception of the universe, based primarily on the one apparently simple assumption of Copernicus that the earth is not fixed but has a rotational and orbital motion. It would be folly, therefore, on my part to presume, at once, a final explanation of the entire universe, or even of some of the most common celestial phenomena, such as Day and Night, change of Seasons, etc., based on the one simple discovered fact that the earth is a hollow

sphere. There are so many possibilities involved in such a new conception that it will require the service of all the brilliant minds in science for the next hundred years or more to work out, on the new and true basis, a final conception of the universe as a whole ; and even then we can never be absolutely sure of its conclusiveness for the very nature of celestial phenomena, in contradistinction to phenomena at the earth's surface, forbids absolute penetration, by the most sagacious of mortal minds, into the mysteries of the upper regions.

There are at least two conclusions, however, that must necessarily follow from the fact of the earth's concavity, viz :—

(1) That the human family is living on the **inside** of a hollow earth, having an internal diameter (as far as we know at present) of approximately 8,000 miles.

(2) That the heavenly bodies being visible, as they are from every part of the earth's internal surface, are therefore all enclosed in the hollow earth.

At the present stage of inquiry, therefore, it would be decidedly unscientific for any one to expect an immediate and decisive answer to such questions as : What is the cause of Day and Night? What is the cause of eclipses? What are the Stars? etc.,—for the explanation of these phenomena must always be based on observations containing certain elements of assumption. In order to satisfy in some degree, however, any unreasonable sceptics who will read this book, I have appended a brief description of what I myself consider to be the cause of Day and Night. My suggestions need be received only in so

far as they are examined and verified by the recognized scientific authorities. My one present great desire is that this brief introductory work, if it doesn't win very many immediate converts to the new conception, will at least stimulate scientific investigators in every field of labor to stop their work long enough to make a rigid and thorough examination of the earth's surface on which we live.

CHAPTER 1.

Introduction.

“It is to be observed in the first place that *the universe is spherical* *; not only because that it is the most perfect of all figures, needing no fastening or junction, complete in itself; but because it is the most capacious figure, fittest to enclose and preserve all things; because the most perfect portions of the universe—the sun, moon and stars—are seen to have that shape; and lastly because, as we see in drops of water and other liquids, all things capable of assuming the figure they prefer, select the figure of a sphere. The sphere of the stars, being the outermost and chief of all the spheres, is immovable because enclosing all other spheres.”—COPERNICUS, the founder of modern Astronomy, written in 1543.

“The sun lies farther from the fixed stars than these lie from each other. Within the sphere of the fixed stars there is a vast concavity girt round on all sides by the stars. The sun lies within this space, so that the solar system occupies an exceptional position in the universe. The concavity enclosing the sun lies also near the center of the zone called the Milky Way. This is shown by the fact that the Milky Way appears as a great circle on the heavens, and sensibly of uniform brightness throughout. The space occupied by the stars, limited on the inside by the concavity enclosing the sun, is also limited on the outside, and thus forms an *immense spherical*

* The italics in these quotations are the Author's.

shell, outside of which lies space. The sun is the chief body—THE HEART OF THE UNIVERSE—whence flow light and heat ; he is also the ruler of the planets and their satellites. The stars according to this hypothesis are *much smaller than the sun*, but shine with their own light, the light of each having its own proper color.”—KEPLER, one of the earliest and greatest of the exponents of the Copernican system, written in 1620.

“ I wish that some one would undertake to give a history of celestial phenomena after the method of Bacon, and describe the sky exactly as it appears at present, *without introducing a single hypothesis*.”—DESCARTES, 1632.

“ If asked whether science has solved, or is likely in our day to solve, the problem of the universe, I must shake my head in doubt. Behind and above and around us *the real mystery lies unsolved, and, so far as we are concerned, incapable of solution*.”—TYNDALL, in the Fortnightly Review.

“ The day will arrive when, *like all those which have shone before it*, this seductive hypothesis will lead to more errors than discoveries. It will, however, have been improved, and it will have become a very vast and very complete edifice which some will not willingly abandon ; *for those who have made to themselves a comfortable dwelling place on the ruins of ancient monuments are often too loth to leave it*.”—POINCARÉ, on the Electron Theory, “ The New Physics,”—1915.

“ The true theory must accord, not with this fact or that, but with *all* the known facts. It is singular what mistaken

notions are held by some on this point, who seem to think that the holder of a theory ought to be ready to concede that some facts are inconsistent with it. A true theory must accord with *all* known facts ; that is, though we may not always be able to show how certain facts are to be explained by it, *we must no longer hold a theory after we have been forced to admit that even a single fact is opposed to it or inconsistent with it.*"—PROCTOR, in "The Universe of Suns."

"Ten thousand theories, no matter how ingeniously designed or beautifully expressed, can never compare with *one well-established fact simply expressed.*"—The AUTHOR.

"It is safe to say that nine-tenths of all that mankind believes, or thinks it believes, is destitute of any solid basis of facts. It is perhaps not so much the fault as the misfortune of humanity that this is true. We must not forget that, much as mankind has achieved in the wresting from Nature the secret of her laws, *the intellectual world is yet in its infancy.*"—HUDSON, in "A Scientific Demonstration of the Future Life."

"Many students think that a little less mathematics and a little more Nature would be good for the physics of the present and the future. Like the people of our cities, the physics of the day must get 'back to Nature.' We fancy that we have sought out many inventions in our time, but *future generations will pity us for our ignorance and our impotence.*"—SALSBY, in Harmworth's Self Educator, 1914.

"The determination of the figure of the earth is a problem of the highest importance in astronomy, inasmuch as the

diameter of the earth is the unit to which all celestial distances must be referred.”—Encyclopædia Britannica, Vol 1., p. 597.”

“The world is to be discovered by the investigations of geometry and by the *practical interrogation of Nature*.”—DRAPER, in “The Conflict Between Religion and Science.”

“No theory should ever be spoken of as if it were a *truth*, until it is plainly proved to be such, *with no possibility of mistake*. So with regard to the earth’s inside and what it is made of, we cannot get beyond theories ; but when we speak of the *earth’s crust*, there is not the same sort of difficulty, *since here we can see, and feel, and examine for ourselves*.”—A. GIBERNE, in “The World’s Foundation.”

“One of the greatest of modern mathematicians, referring to this subject, says that the point here contested was one which is for mankind of the highest interest, because of the rank it assigns to the globe that we inhabit. If the earth be immovable in the midst of the universe, man has a right to regard himself as the principle object of the care of Nature. But if the earth be only one of the planets revolving round the sun, an insignificant body in the solar system, she will disappear entirely in the immensity of the heavens, in which this system, vast as it may appear to us, is nothing but an insensible point.”—DRAPER, in “The Conflict Between Religion and Science.”

“When we consider that the advocates of the earth’s stationary position can account for and explain the celestial phenomena as accurately, to their thinking, as we can to ours, in addition to which they have the evidence of their senses,

which we have not, and Scriptures and facts in their favor, which we have not, it is not without some show of reason that they maintain the superiority of their system. Whereas, we must be content, at present, to take for granted the truth of the hypothesis of the earth's motion for one thing. We shall never, indeed, arrive at a time when we shall be able to pronounce it absolutely proved to be true. The nature of the subject excludes such a possibility. However perfect our theory may appear, in our estimation, and however satisfactory the Newtonian hypothesis may seem to account for all celestial phenomena, yet we are here compelled to admit the astounding truth, that if our premise be disputed and our facts challenged, the whole range of astronomy does not contain the proofs of its own accuracy. Startling as this announcement may appear, it is nevertheless true ; and astronomy would indeed be helpless were it not for the applied approval of those whose authority is considered a guarantee of its truth. Should this sole refuge fail us, all our arguments, all our observations, all our boasted accuracy would be useless, and the whole science of modern astronomy must fall to the ground."—Dr. WOODHOUSE, Cambridge, England.

It is one thing for any person to convince himself, by a series of careful observations and thoughtful considerations, that he has discovered a new and important truth that has hitherto escaped the vigilant eyes of the human race ; but it is

quite another matter—and an exceedingly difficult one—to introduce his discovery to a critical and conservative public. I fully realise—or think I do—these conditions, and am therefore endeavoring to co-opt a number of others in the collating of facts sufficient to convince the world of science that a really new discovery has been made. Scientific thinkers of to-day require—and justly so—a vast amount of evidence to convince them that the Copernican system is not true: that the earth's surface is not convex; and that we are not living on the outside of a solid globe 8,000 miles in diameter, which rotates on an axis once in every 24 hours, and revolves round the sun once in every three hundred and sixty five and one-fourth days—facts that have been taught and passively believed for more than 300 years.

Strange as it may seem to the average reader when one takes the trouble to make a careful examination of the subject, he will find an astonishing lack of *conclusive* evidence put forth by science to substantiate these well-known assertions.

As to the rotation of the earth on an axis, for example, Matthew Henry, in his Commentary on Job 38 says :—"It is to this day a dispute whether the earth stands still or turns round." Another modern writer says :—"There is really nothing but probability to show us whether we are moving in one direction or the stars are moving in the opposite one. During the greater part of the life of mankind (that is, until the time of Copernicus) the latter view was universally accepted."—(Garrett Fisher, in "Astronomy," Harmsworth's Self Educator). Likewise, the *tangible* evidence maintained in support of the earth's *convexity* is very meagre and superficial—and by *tangible* evidence I mean that in which all assertions are based on observations of phenomena entirely *accessible* to, or within the reach of, our physical senses ; it excludes, therefore, as inconclusive, *all evidence* based on points of reference situated outside the earth's atmosphere, that is, in the "heavens" themselves or in any other place *inaccessible* for actual personal examination.

There are, among others, three important assumptions presented in modern textbooks on

Geography and Astronomy, that are supposed to furnish conclusive proof that the earth is a solid sphere, or practically so ; and the supposition has always been, of course, that the human family lives on its external surface. These assumptions are as follows, viz:—

(1) The earth's surface is convex as shown by the gradual disappearance of vessels going out to sea, the hull first becoming invisible, then the sails, and finally the masts ; (2) The earth's shadow as seen on the moon at the time of a lunar eclipse, indicates that the earth is a sphere ; and (3) The fact that as one travels northward from the earth's equator, the elevation of the pole star changes in proportion to the increase in latitude, proves the globular form of the earth (a conclusion based on the supposition that the pole star is at a comparatively infinite distance from the earth).

The first of these will be dealt with presently ; the second and third are at once excluded from the class of *tangible* evidence, since, in the first place, it is obviously impossible for any one to prove (although people seem to think it should be

taken for granted) that it is the shadow of the *earth* that is seen during a lunar eclipse ; likewise, the pole star—as well as all the other so-called fixed stars—may or may not be at an infinite distance from the earth, for this assertion is itself based on the fundamental supposition that the earth moves in an orbit round the sun, although it is impossible, as more than one writer has declared, to furnish conclusive evidence that such a movement is going on. I lay great stress on the distinction that should be made between assertions based on points of reference lying beyond the reach of personal, tangible observations (as are practically all the assertions of modern astronomers), and those based on phenomena which occur—and which may be observed by any normally intelligent person—on the earth's surface itself.

CHAPTER 2.

Is the Earth's Surface Flat, Convex, or Concave?

The prominent English scientist and writer, Dr. R. A. Proctor, tells, in his "Myths and Marvels of Astronomy" under a chapter, entitled "Some Astronomical Paradoxes," of an ingenious person who under the assumed name of Parallax travelled about England 50 years ago trying to convince people that the earth is not round like a globe, but flat. The experimental evidence put forth by Parallax to prove his assertion was this:—"Having betaken himself to the Bedford Canal where there is a long uninterrupted stretch of water for six miles, he tested the surface for curvature and (as he said) found none." Proctor goes on in a derisive manner deploring the fact that "if writers of modern textbooks had treated their subjects more fully and carefully, such aberration from the truth by otherwise intelligent persons could not have taken place." In another place he introduces the conception of a concave

earth—the first on record, as far as I have been able to ascertain. He records the universal experience of aeronauts going up in a balloon, who “*find the earth presenting the appearance of a great hollow basin, or the concave side of a well-curved shield.*” After almost exhausting his supply of ironical remarks on the flat-earth theory of Parallax, he suggests that: “Indeed, to be strictly logical, the followers of Parallax ought to adopt the faith that the earth is not flat, but basin-shaped, which hitherto they have not been ready to do.” He still keeps the fundamental assertion of Parallax in mind, however, for at the close of his discussion he says:

“Of course, if that statement had been true—if he had, with his eye a few inches from the surface of the water of the Bedford Canal, seen an object close to the surface six miles from him—there manifestly would have been something wrong in the accepted theory about the earth’s rotundity. . . . For a six mile straight-edge along water would be as severe a blow to the belief in a round earth (or a convex earth, he might have said)

as a straight line on a sea-surface from Queenstown to New York." (This was written nearly 50 years ago.)

I hope to show by a few illustrations that Parallax was right in his contention that the water's surface shows no curvature *downward*, but that he was ridiculously misled in his belief that the earth is flat; and that Proctor was mistaken in his contention that the water's surface is convex, notwithstanding all present belief to the contrary. I propose to show that the earth's surface is neither flat nor convex, but concave. Fig. 1 *A*, *B*, and *C**, illustrate the three conceivable forms of the earth: *A*, a convex or solid sphere; *B*, a concave or hollow sphere; and *C*, a flat disc. In his consideration of the earth's form Proctor's argument against Parallax's flat-earth idea has about as much weight as that of the geometrician who, in comparing the lengths of two straight lines, would use some such argument as follows:—Line *A* is *not equal* to Line *B*, therefore it is *shorter*; leaving out of consideration

* See diagrams enclosed.

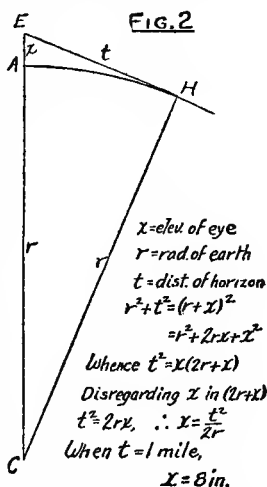
altogether the possibility of its being *longer*. The earth is not flat, therefore it is convex !

Since Magellan circumnavigated the earth—and from a number of other considerations—we are certain that the earth's surface is not flat, as many of the ancients believed. It remains, then, to ascertain whether it is convex or concave. The present theory would have us believe that it is convex, but in spite of the apparently enormous weight of evidence accumulated by scientists, I make bold to announce my convictions that it is not convex, but concave. During the past several weeks I have made upwards of 50 observations in different places along the Yangtsze River and the Grand Canal, in China, and in each case I discovered phenomena which show conclusively that the water's surface has a distinct curve **upwards**. My purpose now is to illustrate to the reader the nature of these phenomena and to suggest how they may be successfully observed.

CHAPTER 3.

Seeing Distant Objects Over Water.

Table I, taken from "The Sailor's Pocket Book," by Bedford (1890), gives the distance of the horizon corresponding to various elevations of the observer's eye above sea level. *The usual correction for atmospheric refraction is included in these values.* For any distance of horizon in miles, the *theoretical* elevation, in inches, of the observer's eye may be found by squaring the number of miles and multiplying by 8 (See Fig. 2). Thus, suppose the distance of horizon is 11 miles. Squaring and multiplying by 8, we get 968 inches, or $80\frac{2}{3}$ feet. According to the Table, the elevation, corrected for atmospheric refraction,



for this same distance of horizon, is only 70 feet. This means that the *actual* distance of the horizon (or supposedly upper limit of the earth's convex surface) as seen from an elevation of 70 feet, is practically the same as the *theoretical* distance (that is, refraction neglected) at an elevation of $80\frac{2}{3}$ feet. In other words, the idea is that atmospheric refraction has a tendency to "elevate" distant objects. The amount allowed in this correction is about one-sixth the theoretical value.

I. TABLE OF DISTANCES.

Table of Distances at which Objects can be seen at Sea, according to their respective Elevations and the Elevation of the Eye of the Observer.

Heights in feet.	Distances in statute or English miles	Heights in feet.	Distances in statute or English miles	Heights in feet.	Distances in statute or English miles
5	2.958	70	11.067	250	20.916
10	4.184	75	11.456	300	22.912
15	5.123	80	11.832	350	24.748
20	5.916	85	12.196	400	26.457
25	6.614	90	12.549	450	28.062
30	7.245	95	12.893	500	29.580
35	7.826	100	13.228	550	31.024
40	8.366	110	13.874	600	32.403
45	8.874	120	14.490	650	33.726
50	9.354	130	15.083	700	35.000
55	9.811	140	15.652	800	37.416
60	10.246	150	16.201	900	39.386
65	10.665	200	18.708	1000	41.833

The following is an example illustrating

the methods employed in actual practice for determining elevations and distances at sea.

Example.—A tower 45 feet high will be visible (and this means only the *top* of the tower) to an observer whose eye is elevated 5 feet above the water, 12 miles nearly: thus from the table:—

5 feet elevation,	distance visible	2.958 miles.
45 " " " "		8.874 "
		<hr/> 11.832 miles.

Fig. 3 shows a section of the earth's surface across the Yangtze River from Woosung, near Shanghai, China, to Tsung Ming Island, a distance of 11 miles, as given on the authentic British Admiralty Chart (1915).

The maximum height of the supposedly convex bulge of this section, *PD* Fig. 3*A*, is practically 20 feet. We have here, then, the equivalent of an absolutely opaque wall of water through which objects on the Tsung Ming island shore are supposed to be seen (or rather, not seen), by an observer whose eye is but a few feet above sea level at Woosung.

On February 1, 1917, I made this observation under ideal conditions. The atmosphere was very clear and free from fog of any kind. It was about 3.30 p.m. and the sun behind me shone full upon the objects to the northeast on Tsung Ming island 11 miles away. The first observation was made with my eye 15 feet above sea level, as determined from a permanent tide staff only a few feet away. Through prismatic field glasses (8x) I viewed the entire shore line of the island, not only that part which lay nearest me to the northeast, but also a long stretch 12 miles or more away, to the north. The vegetation anywhere on the island is scarcely more than 20 feet above sea level. I could see also along the shore, not far above the water's edge, several white-painted Chinese houses which reflected the brilliant light of the western sun. A study of Fig. 3*A* and of Table I will show the impossibility of observing such a phenomenon on a convex surface. Of course, the ready critic will come forward with the usual explanation that what I saw was nothing but a mirage ; but such persons can be convinced only by making the observations themselves. It

is impossible to account for the phenomenon in this way. Let the mathematical reader calculate how much the objects 11 miles away would have to be "lifted" by atmospheric refraction in order to be seen above the convex bulge 20 feet thick; it is several times the maximum value allowed by surveyors. But I have not finished with this. Having in mind, for the moment, the possibility of a mirage effect, I decided to try a lower elevation and accordingly descended to a point where with my eye only 10 inches (!) above the water I still saw the vegetation along the island, none of which, as I have mentioned, is over 20 feet high. From the Table we can see that for objects to be visible (and only their tops at that), from such a low elevation, they would have to be about 70 feet high !

Now, why not conceive the water's surface to be concave, like a large basin, as Proctor suggested, as illustrated in Fig. 3*B*? This conception explains the phenomenon, and delivers us from innumerable difficulties con-

fronting us in a number of other phenomena, only a few of which I can touch upon in an introductory work of this kind. I invite the reader to verify this experiment at the first opportunity.

CHAPTER 4.

The "Wireless" Phenomenon.

Perhaps we who are living in this wonderful age of discoveries and inventions should not deem it so surprising that the many phenomena occurring at the earth's surface have not hitherto been more carefully observed and their true meaning ascertained. Once possessed with the obstinate belief that the human family is living on the external surface of a solid earth, blind to all other possible conceptions of the earth's form, and content to explain the many mysterious phenomena by all sorts of patched-up theories and assumptions, rational or otherwise—more often the latter, the mind of the man of science has come to be what it is to-day, molded and fashioned about a nucleus of belief that has no more substantial claims to truth than countless other beliefs that have come and gone in the ages past.

It was not until our own present generation that the most wonderful of all natural phenomena was, in a very real sense, revealed to man:

namely, the invisible "ether," that marvellous "substance," or "force" or whatever it may be, which seems to pervade all space, as well as material substances visible and invisible. We know it best, perhaps, through its manifestations in the wireless telegraph ; and it is the testimony of this instrument which I now propose to present as supplementary evidence to that obtained from the simple observations made by the human eye, as described in the previous chapter.

Physicists tell us that light waves, when passing through a uniform medium, radiate in straight lines from the source of illumination ; and this fact may be easily demonstrated experimentally by any one. Physicists also tell us that the invisible ether waves, set in motion by the wireless telegraph transmitter, behave in the same manner : that is, they travel in straight lines radiating outward from the generating source, just as the rays of light radiate outward in all directions from a candle or a lamp.

It is unnecessary for our present purpose to go any further into a detailed description or explanation of these "wireless" waves ; it is only

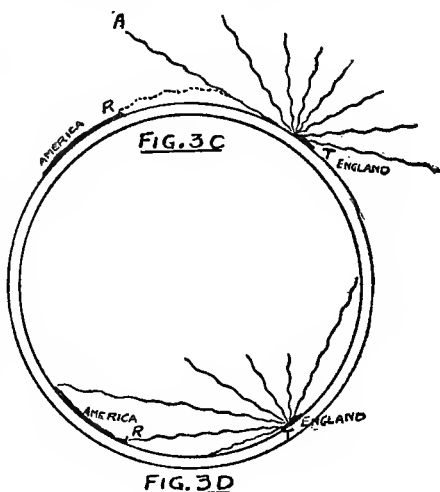
important to know that, like light waves, they are propagated in a rectilinear and not a curvilinear direction ; hence, we are bound to conclude that they cannot be detected if there are obstacles intervening between the transmitting and receiving instruments, any more than rays of light from a lamp can be perceived by the eye if they are intercepted by objects between the eye and the lamp. Here is what Cressy, in "Discoveries and Inventions," (1914) says :

"In spite of a high degree of perfection in the instruments for producing electrical waves and in those used to detect them, the wave meets with many adventures on the way, and there is some uncertainty as to how it really gets there. One of the problems which, while it has been surmounted practically, *still evades theoretical explanation*, is the particular path pursued by the wave between the stations. When Marconi first made the attempt to put England and the American continent into communication, there were no scientific facts which pointed to success, but there were some which indicated the impossibility of surmounting the great aqueous hump of the

Atlantic, 125 miles high, which lies between. An electric wave is in effect a very long light wave travelling with the same velocity—186,000 miles a second—and possessing many other similar characteristics. Now light waves show a rooted objection to turning a corner. Save for a slight bending around the edges of objects, they pursue a straight path from origin to destination. If an electrical wave were endowed with equal rectitude, and were launched on its way from Canada to Poldhu, it would arrive there something like a thousand miles above the land ! Signals hovering in the heavens above and having no tangible connection with the earth below would be rather useless ; from that height they could not even be collected by a kite. Fortunately, however, the waves come to earth themselves (which is very surprising), and there is some evidence to show *that they travel all the way through the air*. Perhaps a more striking illustration of what the curvature of the earth involves is to be found in the fact that when receiving signals at Buenos Ayres from Clifden, a distance of 6,700 English miles, Marconi was

detecting waves which had been deflected from their original direction (supposedly) by 97° ! . . . Sufficient will have been said to indicate in some measure the extraordinary progress that has been made since the birth of the invention in 1896, and to explain to some extent the simpler principles upon which that and subsequent improvements have been based. The reader will be able to see, in imagination, the powerful waves spreading out from the transmitting aerial, and, in some as yet inexplicable way, curving round the surface of the earth."

Figure 3 C illustrates the conditions under which the wireless waves are supposed to operate, according to the convex theory. In order that the tangent ray, TA, may be detected by a receiving instrument at R, it is necessary to suppose that the



ray is bent down as indicated by the dotted line. But such a supposition is in contradiction to the laws which physicists themselves declare to be true regarding light or electric waves. We realize the predicament here presented. As soon as we turn, however, to the conditions illustrated in Figure 3 *D*, all difficulties vanish at once. It requires no further elucidation for the reader to draw his own conclusion as to which of these two conceptions is more likely to be the true one and the one more reasonable to accept.

CHAPTER 5.

The Mirage.

Persons who insist on explaining various phenomena, such as the one described in Chapter 3, as due to mirage effects, certainly do not stop to consider the weakness of their arguments. I have been doing a great deal of research work on the subject of mirages and have come to a definite conclusion that they cannot be explained by atmospheric refraction and reflection as maintained by all modern writers of scientific text-books. Furthermore, I have come to the more important conclusion that the mirage furnishes direct and unmistakable evidence of the earth's concavity.

It is a matter of common experience that the so-called mirage does take place ; and since the prevailing theory of the earth's form requires that the actual position of distant objects shall be *below* the observer's horizon (and therefore invisible), when at times such objects are distinctly seen to be *above* the horizon, it is

obviously necessary to frame up some such hypothesis as atmospheric refraction to account for the phenomenon.

Before proceeding to a discussion of the commonly accepted explanation of the mirage I will present here a few records of observations that I have come across in my research work. The reader should bear in mind the pictures of the "inundation," and other effects, when he comes to read my chapter on the Disappearance of Vessels. It is indeed remarkable that the same phenomena which I myself have repeatedly observed to occur over the surface of water, have also been observed over land surfaces, and their records have come down to us as authoritative evidence of the earth's concavity.

Chambers, in his "Information for the People," gives the following account, viz.:

"In the sandy plains of Egypt, the mirage is seen to great advantage. These plains are often interrupted by small eminences, upon which the inhabitants have built their villages, to escape the inundations of the Nile. In the morning and evening objects are seen in their natural form

and position ; but when the surface of the sandy ground is heated by the sun, the land seems *terminated at a particular distance by a general inundation*; the villages which are beyond it appear like so many islands in a great lake, and between each village an inverted image of it is seen."

Mary Somerville, in "The Connection of the Physical Sciences," records the following :

"When extraordinary refraction takes place laterally, the strata of variable density are perpendicular to the horizon, and if combined with vertical refraction, the objects are magnified as when seen through a telescope. From this cause, on the 26th of July, 1798, the cliffs of France, *fifty miles off*, were seen distinctly from Hastings as if they had been close at hand ; and even Dieppe was said to have been visible in the afternoon."

Lardner's "Handbook of Natural Philosophy and Astronomy" contains the following :

"Various fantastical optical effects of this kind are recorded as having been observed during the campaign of the French army in Egypt. On this occasion, a corps of savants accompanied the

army, in consequence of which, the particulars of the phenomena were accurately observed and explained. When the surface of the sands was heated by the sun, the land seemed terminated at a certain point by a general inundation. Villages were seen standing at elevated points like islands in the middle of a lake, and under each village appeared an inverted image of it. As the spectator approached the boundary of the apparent inundation, the waters seemed to retire, and the same illusion appeared round the next village."

The French writer Pouchet gives us the following most interesting account in his book "The Universe" (1877) :

"It is in the sand deserts that the phenomenon of the mirage takes place most frequently. I was enabled to see it once in all its splendour.

"The captain or reis of our escort had asked leave to stay at a part of the Nile where stood one of his harems, in order to pass the day there with his wives and family. I say one, for he had several, ingeniously established along the river, the scene of the continual voyages which he made. He stopped by successive stages at

each of his establishments, in such a way as not to excite the jealousy of any of the sultanas whom he maintained.

“I had profited by this halt to make an excursion into the desert, and had started when the reis, seeing me in the distance, came with some Arabs of his tribe to beg I would accept the hospitality of his roof. In the East to refuse such an offer would be almost an offence, so I turned towards the oasis which he inhabited. It was a delicious hamlet, crowned with date-trees, and the entrance to it was picturesquely decorated with some tombs of a most charming appearance.

“After the frugal repast of dates and milk which was offered me, I plunged into the desert and I was already at a distance when the idea came into my head to salute this hospitable abode for the last time. But every thing was transformed. The picturesque village seemed enveloped in a magnificent sheet of the most transparent waters in which the dwellings, palm-trees, and tombs were reflected in a marvellous manner. The phenomenon was produced with

such exactness, and the sheet of water was so beautiful and limpid, that if I had not a few minutes previously traversed the spot which it occupied on the burning sand, I should have thought it real. Such is the mirage, which so often and so painfully deceived our worn-out soldiers when they traversed these very regions. Exhausted with fatigue and dying of thirst, they thought they saw in the distance the water they longed for so much, while it was only a bitter delusion!"

Now let us see just what the prevailing explanation of the mirage involves. Figure 3E illustrates a portion of the earth's surface

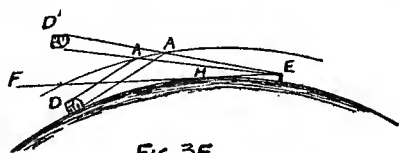


FIG. 3E

supposedly convex. The observer's eye is at the point *E*. The object *D* is beyond the horizon *H* and below the line of sight *EF*, and is therefore invisible from the point *E*. Over heated surfaces of the earth such as sandy deserts, it is claimed that the atmosphere near the earth is rarefied in such a manner that a sort of reflecting surface is formed by a layer of air between it and the upper

and more dense regions. Rays of light from the object D are bent upwards, as it were, by atmospheric refraction until they reach this reflecting surface, or perhaps to be more scientifically exact, until the critical angle of the rarefied air is reached, at the point A , when they are then reflected down to the point E . Since the rays of light from the object appear to come to the observer in the direction AE , an inverted image of the object is seen at D' . To explain the virtual, or erect, image, which is seen more often than the inverted one, and is directly over the latter, it is necessary to suppose that the rays of light are made to cross and recross in various ways by atmospheric refraction until the final results appear as actually observed by the eye.

The more I study these "explanations" and the diagrams usually found in school text-books claiming to enlighten the student as to the true cause of the mirage, the more indignant I become to think that such so-called scientific teaching is allowed to go unchallenged. Now if the mirage is due to atmospheric refraction brought about by unusual rarefaction of the air

near the earth's surface, we are forced to suppose that the layer of air from which the rays of light are finally reflected to the eye, has become a perfect mirror, for all authentic records of observations show that the mirage images are perfectly clear and distinct. Every portion of the air through which the rays of light pass would have to be heated with perfect uniformity; there could be no irregularities, such as we see on the surface of water when disturbed by the wind thereby greatly distorting the reflection of objects in it. Are such perfect conditions in the atmosphere conceivable? I leave it with the reader to answer the question for himself.

Is it not more reasonable to suppose that distant objects, such as rivers, lakes, cities, etc., appear to be above the horizon simply because they actually are above the horizon, and that these objects become visible, clear and distinct as at times they are observed to be, when the atmosphere near the earth's surface is unusually rarefied?

CHAPTER 6.

A Study in Reflections.

The first observation that led me to doubt seriously the convex theory of the earth was made on Saturday afternoon, November 11, 1916. I was returning with a friend from a trip across the Yangtze River at Chinkiang, China. About 4 miles down the river (as afterwards ascertained from a British Admiralty Chart) near a bluff called Hsiang Shan, I observed a white gate, the top of which I afterwards ascertained to be about 12 feet above sea level. Being in a very small shallow-bottom Chinese boat, I was able to make the observations with my eye only about 30 inches above the surface of the water. What I saw is accurately portrayed in Fig. 4*A*; what I should have expected to see, according to the convex theory, is indicated by Fig. 4*B*. The diagrams require but little elucidation. If the earth's surface is convex, one should expect to see nothing above the horizon *HH*, except that part of the object actually extending above the

observer's horizon line. Everything beyond and below this line, one must necessarily conclude, should be entirely invisible. But I saw distinctly the water's surface *all the way* down to the shore directly in front of the white gate; I saw all the white gate itself; and, what is more remarkable, I saw its reflections in the mirror-like space beyond and above the apparent horizon.

Since that day I have made a great number of observations of similar reflections, and in each case I have found the phenomenon precisely the same as in this first one. I have observed the phenomenon when the surface of the water was rough, as it usually is on the great Yangtze River, and I have observed it when the surface was as smooth as glass, as on the Grand Canal. In all cases, in every direction, throughout the entire circle of my horizon, I have found this mirror-like space extending beyond and above what is supposed to be the limit of the earth's convex surface. In this mirror-like space,—which, for want of a proper term, I have named the **Superscene**,—all objects are perfectly re-

flected. It is as if one were looking at objects placed on an immense circular mirror inclined, at a very small angle, upward and away from the apparent horizon. Indeed, I have arranged such an apparatus on a small scale, using an ordinary plane mirror, by which I was able to reproduce the same phenomenon. This very simple apparatus is illustrated in Fig. 5*A*. The mirror, on which are placed small paper images, *P*, of boats, trees, etc., is inclined at a very small angle upward, and observed from a point *E*, a few feet away. The objects and their reflections are seen as in Fig. 5*B*. Now suppose the mirror to be inclined downwards, as in Fig. 6*A*. The upper portion of some of the objects could be seen over the near edge of the mirror, as in Fig. 6*B*; but it would be utterly impossible to see their reflections.

The best observations I have made were on the Yangtsze River at Silver Island, near Chinkiang, China, during the month of January, 1917. Up till that time I had not been altogether certain that what I saw beneath the objects in the superscene was their true reflections, or simply an optical illusion due to atmospheric refraction. At Silver

Island, however, my doubts were completely dispelled. It was an ordinary Chinese fish-net that did it. Figure 7 illustrates what I saw. The net is shown extending out horizontally from the bank of the river opposite Silver Island. It was beyond the horizon line, *HH*, but its reflection was distinct and unmistakable. The downward curve of the net was beautifully reflected in an upward curve, as shown in the illustration (only the drawing is a very crude representation of the actual scene; here is where the art of telephotography must perform a great service in the future, in the study of reflections in this superscene). The observation was made through prismatic field glasses ($8\times$). My eye was about 3 feet above the surface of the water; and the distance of the horizon line, *HH*, was about 2 miles. At the same time, I observed the vegetation on the shore line far beyond (5 or 6 miles) Silver Island. This is also shown in the illustration and appears some distance above the horizon line.

I must describe briefly the last observations I made, Saturday, February 3, 1917, before writing this article. I was travelling from Hangchow

to Mokanshan. A large part of my journey was made in a small Chinese foot-boat (a boat operated by the feet) on the Grand Canal—that most wonderful of all Chinese waterways. For several miles, the canal being comparatively straight over long stretches, I was able with my eye scarcely 15 inches above the water to observe the smooth surface of the canal both before and behind me as the boat glided swiftly along. It is difficult for me to describe what I saw, and still more difficult to describe my sensations as I reflected on the significance of the scenes I was witnessing. All I could think of was the impossible fairy tales in the Arabian Nights Entertainment, where human beings are allowed to penetrate the mysteries of another world. But here was no fairy tale ; although, to me, it was just as remarkable because of its vivid reality. There, both before and behind me, was that wonderful mirror-like space above the horizon, constantly changing with the onward movement of the boat. On its surface there was a continual panorama of moving objects so characteristic of life on a Chinese water-way. Here were fisherman, some with nets, others with

cormorants flitting about; there were slow-going junks, house-boats, sampans, small gun-boats and rapid mail-boats—all perfectly reproduced on the surface of this superscene. My belief in the old convex theory of the earth was entirely shattered. We have been taught that there is nothing to be seen (except the tops of objects, as I have mentioned) beyond the horizon: that what is called the observer's horizon is the upper limit of the earth's surface; but such ideas are incompatible with the observed phenomena.

CHAPTER 7.

How and What to Observe.

The observer should find a body of water having an uninterrupted surface view for at least two or three miles. It is better to have a distant shore line for a background. The preliminary observation may be made with the eye say 3 feet above the water. If no distinct horizon line appears between the opposite shore and the observation point, the eye should be lowered until the horizon line does appear. Beyond and above this line the mirror-like superscene will be observed in which all objects are reflected as in a mirror. The scene may be studied until the observer is completely satisfied that he is not being deceived by an optical illusion. Moving objects like the oars of a row-boat, or a curved object like a fish-net, will show symmetrical reflections perfect and unmistakable.

On water whose surface is more or less smooth, the ordinary reflections as shown beneath the boat *A*, Fig. 8, should not be confused with

those of the boat *B*, or with those of the trees on the distant shore. On a rough surface the first kind are seldom seen, but those in the super-scene are always seen in fine weather. I have found by experience, however, that they are not distinct if the sun is shining on the water directly in front of the observer; the bright reflected light of the sun obscures the reflections. Also, in stormy weather, or when the air is cloudy or "heavy" and the waves are high, the reflections are obscured.

CHAPTER 8.

The Disappearance of Vessels.

We are ready now to treat the evidence furnished by the phenomenon of vessels disappearing beyond the horizon. Figure 9 is a reproduction of the usual diagram illustrating the phenomenon. The observer is situated on the tower at E , his line of sight is EF , and his horizon at H . The vessels are all moving away from the shore, and one by one they apparently disappear gradually as they pass beyond the point H . The smoke of the boat S is visible above the horizon ; the boat itself is entirely out of sight. The other boats appear to pass through the various phases : first, the entire outline of the boat is visible until it reaches the horizon at H , then the hull gradually disappears, next the sails, and finally the masts pass from view. This is the theoretical account of the matter, and, it must be admitted, a very plausible one, conclusive evidence, one would think, of the earth's convexity, as we have been taught in our text-books. But when one comes

to make an actual and careful observation of the phenomenon, he finds that vessels do not disappear in this way at all! The reader has already noticed, no doubt, in some of the illustrations, that only the upper portions of some of the vessels are shown in the superscene. The conditions are accurately portrayed; for it is a fact that the lower parts of all objects, of any distinguishable size, when seen beyond the apparent horizon, appear to be cut off by a certain horizontal line, and *a distinct space is seen between this line and the apparent horizon*. It presents the appearance of horizontal slots having been cut in the superscene, into which the various objects are inserted, as it were, the upper parts only being visible because they are outside. How is this to be explained? I present my explanation in Fig. 10.

Before a clear conception can be had of this illustration, however, it will be necessary to consider briefly the principle of **Perspective Fore-shortening**, a principle hitherto overlooked or disregarded in a study of this subject. The human eye has its limits of vision; two objects

seen beyond a certain point, called the **Vanishing Point**, are not distinguishable as separate objects, but appear as one point. For example, an object one foot high, AH , Fig. 11*A*, placed at a distance of about 3,500 feet from the eye, is seen as a mere point at H , the line EH being the horizontal line of sight. In other words the point A is "brought down," so to speak, by perspective foreshortening, and appears to coincide with the point H . Likewise, a point C , Fig. 11*B*, one foot *below* the horizontal line EH , and placed about 3,500 feet from E , will appear to coincide with the point H . In this case the point C is "brought up" by perspective foreshortening. Applying this principle to objects receding from view, we have a simple explanation of the gradual disappearance of vessels. It must be observed, however, that this phenomenon is no proof as to whether the earth's surface is flat, convex or concave; it may take place on any one of these surfaces and we could not decide which it was by a superficial observation. A study of Figure 12 will make this clear. The hull of the vessel is included in the space below the horizontal line

of sight EH . The entire height of the vessel is 20 feet. Receding from the eye at E , the hull becomes a mere point when it reaches the vanishing point H , 17,500 feet ($5 \times 3,500$) from E ; but the sails being much higher than the hull and therefore subtending a larger angle at E , continue to be visible for some distance beyond H .

This is not the only feature of the phenomenon entering into our considerations. Returning to Fig. 10 we shall see just how the phenomenon takes place on a concave surface. The vessel A , it will be observed, has not reached the vanishing point H , hence its entire outline is visible from E . But the vessel B has passed beyond H , therefore only its upper part is visible, and appears as though inserted in a horizontal slot in the superscene. The important point to be noted here is that all objects, or parts of objects, entirely *below* the line of sight EH , when they have once passed beyond the vanishing point H , are "shut out," so to speak, from the observer's view at E , by the water, or geolinear, surface which at the point C is "brought up" by perspective foreshortening to coincide with the point H .

The lower part of boat B up to the upper limit HK of the superscene is thus completely cut off from visibility. These conditions are plainly shown in the large illustration. The superscene itself is explained as that portion of the water's surface HK extending beyond and above the limit of vision H , and is itself visible only when there are objects large enough to be visibly reflected on its surface. The reader is reminded that this phenomenon of the superscene is observed over land as well as over water, as described in the chapter on the mirage.*

The fact that the upward curve of the earth's surface always extends beyond the limit of vision answers the question why such an upward rise is imperceptible to the unaided eye. The superscene usually extends over such an area at a distance of several miles from the observer that the upward inclination of its surface, even when viewed through moderately strong field glasses, appears exceedingly small.

One rigid test remains now to be made of the phenomenon of disappearing vessels. Suppose a

* Fig. 25 clearly illustrates these phenomena.

telescope were used to extend the limit of vision beyond the second vessel *B* Fig. 10. Would the whole vessel be brought again into view? If not, then we must conclude after all that there is a convex bulge of the earth's surface, or its equivalent, rising up between the vessel and the observer. If so, then we must conclude that there is no such convexity, and consequently prepare our minds to accept the inevitable and revolutionary results of such conditions. Now as a matter of fact, repeated experiments have shown that distant objects, entirely invisible to the unaided eye, can be brought into view again by a powerful telescope. Lack of space prevents my giving an account of these experiments conducted on Lake Michigan a few years ago by the Koreshan scientists; but in the book I am preparing for publication next year a full account of these and many other experiments will be given. Ordinary field glasses are not strong enough to extend the vanishing point very far beyond that of the unaided eye, but a powerful telescope as used by the Koreshan experimenters brought whole vessels into view that were entirely invisible to the naked eye. Fig. 13 illustrates

the results. Only the smoke of the vessel was visible to the unaided eye, as at *A* but the telescope brought the whole vessel into view, as at *B*. It requires no elucidation for the reader to realize that such a phenomenon could not possibly take place on a convex surface. After the vessel had once passed beyond the convex bulge of the earth's surface no telescope ever made could make it visible again.

Let astronomers cease from their fruitless efforts with larger and larger telescopes to fathom the "limitless depths of space"; and let them direct their instruments to this wonderful region beyond the so-called apparent horizon where they will find awaiting them more revelations of Truth than were ever dreamed of in their philosophy.

CHAPTER 9.

Other Phenomena.

There remains now to be mentioned another class of evidence which is entirely different from that already presented, and which demonstrates the concavity of the earth's surface.

Two important experiments may be mentioned, viz. :—

1. In a series of experiments in some deep mine shafts near Chicago a few years ago it was discovered that plumb lines converge upwards instead of downwards! All sorts of explanations were put forward by scientists at the time, but to this day the phenomenon remains unexplained. This means that the *center of the earth must be above our heads instead of under our feet*. Fig. 14 illustrates a practical application of the consequences attending this change of conception. If the plumb lines converge downwards, as ZA and ZB , the results of trigonometrical calculations of the distance of a heavenly body, as the moon, will be different from those based on plumb lines

that converge upwards, as CZ and DZ . In the first case M is found to be about 240,000 miles from the earth; while in the second, it is only a few hundred miles above the earth's internal surface. The corresponding angular measurements " a " and " b ," are the same in both cases but the results are wholly different. Indeed, the distances of all the heavenly bodies must ultimately be found correspondingly less, since the present dimensions of the solar and sidereal systems are after all only relative, and if the fundamental measurement is incorrect, as the upward convergence of plumb lines indicates, it means that the entire visible heavens may be reduced to dimensions small enough to be enclosed in a hollow earth having an internal diameter of 8,000 miles.

2. In another series of experiments, requiring a period of several months, a party of scientists extended, by purely mechanical means, an "air line" perpendicular to the vertical plumb line, *and it came in contact with the water's surface* at a distance from the starting point corresponding to that required of a concave

arc whose radius of curvature is that of the earth's radius according to the convex theory, *i.e.*, 4,000 miles. Fig. 15 illustrates how a straight line, AH , extended perpendicularly to the vertical plumb line, AB , was found to strike the earth's surface at H . The elevation of the starting point A , above sea level was 128 inches, and the horizontal line came in contact with the water's surface at the point H $4\frac{1}{8}$ miles away. Careful measurements of the convergence between the extended line and the surface of the water showed the same relation that exists between a chord and the concave arc of a circle 8,000 miles in diameter. Such results would not be possible on a convex surface ; for the extended line would go off at a tangent farther and farther from the convex arc.

CHAPTER 10.

"An Introduction to the New Cosmology."

The following subjects are treated in the large edition now being prepared for publication under the above title. The synopsis here given will be more or less followed:—

1. A general survey of the Philosophy of Discovery, following Dr. Whewell's treatise on this subject, is presented in an endeavor to show how the new conception has hitherto been overlooked by scientific thinkers.

2. The usual *tangible* and *theoretical* "proofs" maintained in support of the convex theory are presented and fully discussed in an endeavor to show their incompatibility with the observed phenomena at the earth's surface. (See Appendix *B* for a list of these "proofs.")

3. The *tangible* evidence, determined by actual experiments in support of the concave conception, is presented and discussed.

4. There is presented a general survey of the research work done by the writer for several

months past into all the various branches of science relating to the subject; these include Astronomy, Geography, Geology, Physics, Chemistry, Religious Literature and many others.

5. A vast amount of *theoretical* evidence is derived from the above mentioned sources, from which is deduced a theory of the "new heavens" in their relation to the "new earth," arriving finally at a comprehensive conception of the probable structure of the physical world, or universe as a whole.

The reader will find in Appendix C a list of 75 questions all of which will be presented and discussed in the "Introduction to the New Cosmology."

A sample of the material presented in this book is given in the following article under "Present Problems of Astronomy."

Martin, in "Triumphs and Wonders of Modern Chemistry," (1915) says:—

"We have still to face the problem of the continual radiation of heat and light into space. This has always seemed a great waste to many scientists, who could hardly bring themselves to

believe that it was really lost. This objection has been well put by Newcomb. "What," says he, "becomes of the great flood of heat and light which the stars radiate into empty space with a velocity of 180,000 miles a second? Only a very small fraction ($1/100,000,000$) of this can be received by the planets or by other stars, because these are mere points compared with their distance from us. Taking the teaching of our science just as it stands we should say that all this heat continued to move on through infinite space forever. In a few thousand years it reaches the confines of our great universe. But we know of no reason why it should stop here. During the hundreds of millions of years since all our stars began to shine has the first ray of light and heat kept on through space at the rate of one hundred and eighty thousand miles a second? and will it continue to go on for ages to come? If so, think of its distance now, and think of it still going on *to be forever wasted!* Rather say, that the problem what becomes of it is as yet unsolved."

The foregoing is one of the unsolved problems of modern science. The Copernican system has

many such problems. The hollow earth conception, however, settles the "solar waste" problem at once ; for the sun, being a comparatively small body, is enclosed in, and situated at or near the center of, the hollow earth, whence radiate its energies in heat, light, and electricity to all parts of the earth's internal surface, *without waste*. Thus the *economical* superiority of the new conception over the Copernican theory must be recognised.

Figs. 16 and 17 illustrate the vast difference between the old and the new conceptions. In Fig. 16, the earth is seen to be nothing more than a black speck, "no larger than a dust mote glistening in the beams of a giant sun,"—as one writer puts it. In Fig. 17, the earth and its majestic luminary are represented in a proportion more in keeping with that which we might expect from the Great Designer, who, as the sacred writer declares, "created the world not a waste (or in vain), but formed it to be inhabited." (Isa. 45, 18). The earth is simply an enormous electric cell, having the sun at the center as the great positive electrode and the earth's shell as the

negative electrode. The constant flow of the currents of energy between these two great poles is the generative source of all solar and terrestrial phenomena: such as sun-spots, the corona (seen at the time of solar eclipses) and solar prominences, terrestrial magnetism, aurora borealis, zodiacal light, gravitation, etc.

Let not the reader get the impression from Fig. 17 that the whole internal surface of the earth is exposed to the solar radiations at one time. The diagram is drawn in this way to show the relative sizes of the earth and sun; just as the planets, in Fig. 16, are all represented as being enclosed within the actual limits of the sun's disc—which we know is not their true positions. The revolving heavens themselves intervene between us and the real central sun. The probable arrangement is illustrated in Fig. 23, Appendix A.

Another, and by no means unimportant, consideration is the *mechanical* superiority of a hollow earth over a solid one, as illustrated in Figs. 18, 19, 20 and 21. Engineers are acquainted with the fact that of two beams, having the

same area of cross-section, as A and B , Fig. 18, the one with a rectangular section, of a length four times its breadth, as B , is twice as strong as the one whose cross-section is a square, as A , for the reason that the supporting strength of a beam depends on the product of its cross-section by the distance of its center of gravity, g , from the point, d , where the weight is supported. The distance, dg , in B is seen to be twice that in A , hence the supporting strength of B is twice that of A . Similarly, the relative distances, dg , in the two kinds of spheres in Fig. 19 show that the hollow sphere has a decided superiority over the solid one, although there is the same amount of material in both cases. Fig. 20 illustrates the comparative bending strengths of a solid and a hollow rubber cylinder. The hollow one sags much less than the solid one. All nature speaks to us of the superiority of hollow supports over solid ones. Fig. 21 shows a section of pipe grass, the member of a large family, of which the bamboo, so much used by the Chinese in structural work, is the leading type.

And so I might go on with illustrations and examples enough to fill several pages to show merely from the theoretical point of view, that the conception of a hollow earth has everything in its favor, since it explains not only the very important phenomena occurring at the earth's surface, but also the many celestial phenomena that the Copernican system is helpless to comprehend. At the same time it opens up to the world of science for coming generations, entirely new fields of exploration in a number of common everyday phenomena, such as Day and Night, eclipses, etc., which must be investigated from the new viewpoint with all the care and precision hitherto bestowed by hosts of brilliant minds on the hypothetical conceptions of Copernicus.

CHAPTER 11.

Conclusion.

I conclude this little volume by summing up in a few statements the arguments I have presented. In the first place, I have endeavored to acquaint my readers with the fact that scientists have not followed their own rigid principles in that they have left entirely out of their considerations one of the three great possibilities of the earth's form. As long as such possibilities exist in any problem we are bound by the laws of science to investigate them. For example, if a straight line is not equal to another straight line, we cannot ignore the fact that there are still two possibilities to consider; it may be *shorter*, or it may be *longer*. Likewise, if scientists are definitely persuaded, as I believe they are beyond the possibility of a doubt, that the earth's surface is not *flat*, there are still two conceptions to consider: namely, it may be *convex*, or it may be *concave*. Whether it is one or the other does not release us from considering

both conceptions with equal thoroughness. I have shown, therefore, that in this one respect, at least, scientific investigators have been seriously at fault. My great desire is that scientists will investigate the claims of a concave earth with as much thoroughness as they are supposed to have employed in ascertaining its convexity.

Then I have called attention to the fact that one of the so-called "proofs" of the earth's convexity usually found in our text-books on geography and astronomy is incompatible with the observed phenomenon. The diagrams used to explain the gradual disappearance of vessels over the horizon are decidedly inaccurate, as any careful observer must have seen if he had made more than a superficial examination of the phenomenon itself. The tell-tale space—for one thing—which is always seen between the partly submerged vessel and the apparent horizon definitely settles this illusion.

Light travels in straight lines ; but in order to accomodate itself to the convex theory it must travel in curved lines following the convex curvature of the earth (making a small allowance

for refraction) ; else how account for the ability to see distant objects over the intervening bulge which in many observed cases was as much as eighty or a hundred feet high ?

Ether waves of the wireless telegraph also radiate in straight lines, but nevertheless they seem to have no difficulty in travelling over the imaginary “hump” between points on the earth’s surface in some cases five or six thousand miles apart, or about a quarter of the earth’s circumference !

They tell us that the images seen in a mirage are due to atmospheric refraction, and that the real objects themselves are several feet—200 or 300 it may be—below the observer’s horizon. We are to believe, from this, that the atmospheric layer from which the rays of light from these distant objects are reflected has in some miraculous manner—it can be nothing else—become a perfect mirror, over a surface of several miles, it may be, on which there is no irregularities or distortion of vision whatsoever ! I think I have shown clearly the absurdity of such an explanation ; I marvel that scientists

themselves have not reflected on the inconsistencies involved, but of course we must remember that they have been blind, seemingly, to anything but the necessity of retaining the old convex theory at any cost, despite all observed phenomena to the contrary.

I have shown that the distance of a heavenly body, such as the moon, is found to be greatly diminished if the trigonometrical calculations are based on plumb lines that converge upwards instead of downwards. In order to refute this evidence, it will be necessary for scientists to test the convergence of plumb lines by actual experiments; and it is manifoldly more necessary—for their own information, at least, and ultimately for the public in general—that such a test should be made, in view of the fact that the rigid experiments already made a few years ago by the Chicago School of Mines at Calumet, Michigan, showed that the plumb lines do converge upwards.

If any one has the idea that I have overlooked some of the supposedly conclusive “proofs” maintained in support of the prevailing

theory, simply because I have not mentioned them or treated them more fully in this book, he will find by looking over the list of seventy-five questions in Appendix C that the material on this subject has been pretty well exhausted in the research work that I have been carrying on for the past three or four months.

I should like to emphasize two or three points here with regard to the necessity of each reader's considering this matter with more than a passing interest; indeed, for my part, I cannot conceive how any one who has any interest at all in the wonderful works of Nature and in the marvellous truths of Nature that from time to time are revealed to the intellect and soul of mankind,—I say I cannot conceive how such an one can show a spirit of indifference in the face of the evidence presented in this book. Yet it is surprising what a vast amount of indifference one meets, as I have already experienced in my endeavour to show the untenableness of the commonly accepted theory of the universe. We are told, in one instance, by modern scientists that vessels disappear over the horizon in a certain way, and we accept the

statement for granted as conclusive proof of the earth's convexity. But when a careful examination of the phenomenon reveals the fact that vessels do not disappear in this way, thus directly refuting the commonly accepted teaching, we find people still attempting to modify and retain the old belief despite the inconsistencies which it entails. I happen to be so constituted by nature that when I discover such inconsistencies as really do exist in the present theory of the earth's form, it is impossible for me to maintain an attitude of lukewarmness. There can be but one explanation of the earth's form. It certainly cannot be both convex and concave at the same time. The evidence against the convex theory is too great for us to regard it any longer as tenable, despite the vast amount of theoretical "evidence" accumulated during the past three centuries. We need only to remind ourselves of the words of Dr. Woodhouse, quoted in the Introduction, that "if our premise be disputed and our facts challenged, the whole range of astronomy does not contain the proofs of its own accuracy." Now any one of the following observed facts is

sufficient to destroy the "premise" on which the modern system of astronomy has been constructed. I feel that these facts cannot be too strongly emphasized, and therefore reiterate them once more.

(1) *The mirage*, in which objects (or their images, according to the convex theory) are seen above the apparent horizon. The commonly accepted explanation that the atmosphere is transformed into a perfectly reflecting mirror is unreasonable and decidedly untenable.

(2) Partly submerged vessels and other objects, with their reflections, seen in the mirror-like space above the apparent horizon; and the *space* between the unsubmerged part and the apparent horizon.

(3) Ability to see along a eleven-mile straight-edge over water.

(4) Wireless ether rays are propagated rectilineally, yet are received on the earth's surface several thousand miles away.

(5) Plumb lines converge upwards, not downwards.

(6) A perpendicular extended from a vertical plumb line strikes the upward curve of the earth's surface.

(7) Vessels supposed to have passed out of visibility beyond and below the horizon may, with a large telescope, be brought into full view again.

As additional stimulus to reflection I will leave with the reader some typical text-book thoughts which are supposed to be the "last word" of modern astronomers on the vital subject we have had before us. The first article entitled "The Structure of the Universe," is taken from Harmsworth's *Self-Educator*, published in 1914; the second one, entitled "The Future of the Visible Universe," is the concluding article to Professor Howe's "Elements of Descriptive Astronomy," published in 1909.

"The Structure of the Universe—Improvements in the methods of measuring parallax (that is, the annual displacement of stars) caused astronomers to revise their somewhat exaggerated notions as to the distance of the faintest visible stars. They have, in consequence, mostly given

up the theory of innumerable universes in which the fancy of an earlier generation was pleased to run riot, and have formed a fairly coherent though still *somewhat vague idea* of the actual structure of the universe."

"The Future of the Visible Universe—As the sun is continually radiating its heat away, with boundless prodigality, it is reasonable to suppose that the stars, which are but distant suns, are doing likewise. We know of no way in which this expenditure is to be repaid. We can look forward to the time when the sun will become a cold cinder, feeling its way by the starlight through the darkness of infinite space. But will there be starlight then? Many of the stars are larger and hotter than the sun, and, though much diminished in radiance, will yet be able to shed a kindly though feeble light upon his pathway. But the time will come when even the brightest and hottest, having radiated its heat away, will roll a cold corse among its dead companions. Such is the gloomy teaching of our philosophy.

“Once there lived a race of ephemerans, whose dwelling place was upon a thermometer. The span of life of one of them was but a second. Being of a scientific turn of mind they made records of the readings of the instrument. After observations had been made for ten generations they promulgated the theory that the mercury was rising one hundredth of a degree every second. After the lapse of ten generations more the theory was confirmed, and was then called a law. When one hundred generations had passed away, the law was considered so firmly established that no reasonable ephemeran could doubt it. It was the grand and inexorable law of nature: one might question everything, but never this. During the next ten generations they executed a laborious triangulation, determining the distance over which the mercury must still travel before it reached the top of the thermometer, and burst the glass tube. Then it was an easy matter to calculate that the utter ruin of their beautiful dwelling place could not be delayed beyond the ten thousandth generation.

“Great was the humiliation of their scientists but still greater the joy of the ephemerans at large, when it was found, after the lapse of two thousand generations, that the mercury was actually going the other way. Even the scientists were constrained to admit that there were more things in heaven and earth than were dreamed of in their philosophy.”

It is enough for me to state, therefore, as a final comprehensive announcement that

“The mercury has now begun to go the other way.”

APPENDIX A.

Cause of Day and Night.

The usual question propounded by the average person when first the idea of a hollow earth is presented to him, is, "What is the cause of Day and Night?" As stated in the preface of this work, it has not been my purpose to expound any final doctrines concerning that mysterious realm above our heads, which presents so many phenomena beyond the reach of mortal man to explain with any degree of finality. Nevertheless, I append my conception of the heavens as I believe them to be in relation to the hollow earth; and illustrate, in Fig. 23, the probable cause of Day and Night.

The earth's shell is stationary; the heavens themselves revolve once every 24 hours. The central sun is dark on one side and light on the other, and the light side being focalized on the revolving heavens, causes the continual change of day and night. The apparent descension of the sun from the zenith, at noon, to the horizon, at sunset, is explained as follows: It is natural to suppose that the invisible ethereal medium through which the sun's light reaches us, grows denser as it approaches the central sun; hence by a law of Physics we have the conditions in which the rays of light on leaving the focalized sun are bent farther and farther away "from the perpendicular," as indicated in Fig. 23, until on reaching an observer's eye directly beneath the point *Z*, the rays seem to come from the

point W in the west. As the focalized sun revolves beyond this point, it appears to sink below the observer's horizon, or in other words, to set. In Fig. 24 is shown a simple apparatus by which the phenomenon may be studied experimentally. Let an image of the sun or moon be set up at M ; and place an ordinary triangular glass prism P in the position shown. With the eye at E , the image M will appear to be seen along the line EF . The refractive power of the glass prism causes the rays of light to follow the path $MBAE$; and these rays are bent in such a way that, although the side, or edge, of the image is turned toward the point E , yet the full view of the image is seen as at M' . Now the variation in the lateral thickness of the glass prism, being greater toward the center C , corresponds to the variation in the density of the ether towards the central sun, hence there is a similar bending of the rays from the focalized sun as shown in the illustration. At the extreme position of M , in Fig. 24, the image is observed to be somewhat elliptical, or flattened; and this phenomenon is also observed in the rising and setting sun, as shown in the small illustration.

APPENDIX B.

"Proofs" of the Copernican System.

I append here a complete list of the "proofs" maintained by modern science in support of the Copernican system. These fall naturally into two divisions : namely, (1) Those which may be considered as **Tangible Evidence**, being based on observed facts accessible to, or within the reach of, our physical senses ; and (2) Those which may be considered as **Intangible, or Theoretical Evidence**, since they are based on observations of phenomena partially or altogether beyond the reach of our physical senses.

TANGIBLE EVIDENCE.

(The first seven have to do with the earth's globularity).

(1) The circumnavigation of the globe.

(2) The weight of objects is almost uniform at the same height above sea level at all parts of the earth's surface.

(3) The fact that the plane of the horizon, or the direction of the plumb line, changes by an angle which is directly proportional to the distance travelled along the surface of the earth, whatever be the starting point, direction of travel, and distance travelled.

(4) The appearance of vessels coming in from sea indicates that the surface is everywhere convex.

(5) The fact that the sea-horizon, as seen from an eminence, is everywhere depressed to the same extent below the level line, shows that the surface is approximately spherical.

(6) When three signals are placed in line at equal elevations above sea level, the middle one appears above the line of sight between the other two. It is inferred from this that the greater elevation of the middle signal is due to the convex, or upward, bulge of the earth's surface.

(This completes the list of **Tangible** proofs).

THEORETICAL EVIDENCE.

(7) The shadow of the earth, as seen upon the moon at the time of a lunar eclipse, is that which only a sphere could cast.

(Those that follow have to do with the rotational and orbital movements of the earth).

(8) The **Apparent** diurnal movement of the heavenly bodies from east to west indicates that the earth *may* have a rotational motion from west to east.

(9) The eastward deviation of bodies falling from a great height.

(10) Foucault's pendulum experiment. Foucault set a pendulum swinging, and by its turning through a circle during the day it seemed to indicate the rotation of the earth about an axis.

(11) The gyroscopic experiment, also by Foucault, was similar to the pendulum experiment.

(12) The deviation of projectiles, to the right in the northern hemisphere, and to the left in the southern, seems to indicate a rotation of the earth.

(13) Trade Winds, Ocean Currents, and Tides are due to the rotation of the earth.

(14) The deviation of the plumb line towards the equator is due to the earth's rotation.

(15) The ellipsoidal shape of the earth is a consequence of its rotation.

(16) The **Apparent** annual motion of the sun about the earth, seems to indicate that there *may* be an **Actual** orbital movement of the earth about the sun.

(17) Annual parallax, or displacement, of the stars.

(18) Aberration of light indicates the earth's orbital motion.

(19) Variation in the velocity of light from stars in six months, as shown by the spectroscope, seems to indicate a change in the earth's orbital motion.

(20) The discrepancy between the predicted and actual times of eclipses of Jupiter's moons indicates an orbital movement of the earth.

Not one of the foregoing "proofs," tangible or intangible, it will be found, has any weight whatsoever, when subjected to a rigid examination in the powerful search-light of the new conception.

These questions are all taken up and discussed in the "Introduction to the new Cosmology."

APPENDIX C.

Seventy-five Vital Questions.

The following 75 Queries are discussed in the large edition of the "Introduction to the New Cosmology." If the reader has any questions relating to the subject that do not appear in this list he is kindly requested to forward same to the writer.

PART I.

On the History of Cosmology.

- Query 1.—When and by whom was the modern theory of the universe originated ?
- Query 2.—On what observed facts did Copernicus base his theory ?
- Query 3.—What theory was in vogue before the time of Copernicus ?
- Query 4.—What was the form of the universe according to the teaching of Ptolemy ?
- Query 5.—What was the objection to the Ptolemaic theory ?
- Query 6.—What other theories were there besides the Ptolemaic and the Copernican ?
- Query 7.—What was the Tychonic system ?
- Query 8.—Why was the Copernican system finally adopted ?
- Query 9.—What personal conception did Copernicus himself have of the actual form of the universe ?
- Query 10.—What was Kepler's conception ?

- Query 11.—What is the conception of modern scientific teachers as to the actual form and extent of the universe ?
- Query 12.—What do the Chinese, Egyptians, and other ancient peoples have to say about the origin and nature of the universe ?
- Query 13.—What records of Cosmology do we possess in Christian literature ?

PART II.

On the Origin and Nature of the Hollow Globe Conception.

- Query 14.—When and by whom was this idea of a hollow earth originated ?
- Query 15.—If such a conception were possible why is it that scientists have never considered it.
- Query 16.—What is the teaching of Koreshanity ?
- Query 17.—On what observed facts does “Koresh” base his theory ?
- Query 18.—If the Copernican theory is false, and the Koreshan true, why have not scientists discarded the old and false belief for the new and true one ?

PART III.

On the Evidence in Support of the Copernican Theory.

- Query 19.—What tangible evidence do the followers of Copernicus produce in support of the convex theory of the earth ?

- Query 20.—Does not the fact that the earth can be circum-navigated prove that it is a globular body ?
- Query 21.—Since the weight of objects is almost uniform at the same elevation above sea level at all parts of the earth's surface, does this not, likewise, indicate that the earth is practically spherical in form ?
- Query 22.—Does not the fact that the plane of the horizon, or the direction of the plumb line, changes by an angle which is directly proportional to the distance travelled along the surface of the earth, whatever be the starting point, direction of travel, and distance travelled, prove that the earth's surface is spherical ?
- Query 23.—Does not the gradual disappearance over the horizon of vessels going out to sea, prove that the earth's surface is convex ?
- Query 24.—Does not the fact that the sea horizon, as seen from an eminence, is everywhere depressed to the same extent below the level line, show that the surface is approximately spherical ?
- Query 25.—Does not the experiment with three signals on a level line, in which the middle signal was found to be higher than the line of sight between the other two, furnish conclusive evidence of the earth's convexity ?
- Query 26.—What **Theoretical** proofs are maintained in support of the Copernican system ?

- Query 27.**—It would seem that the shadow of the earth, as seen upon the moon at the time of a lunar eclipse, is convincing proof that the earth is a solid sphere. What is the objection to this evidence ?
- Query 28.**—Is it not more reasonable to suppose that the apparent diurnal movements of the heavenly bodies is due to the rotation of the earth about an axis, rather than to attribute to these bodies such inconceivably great velocities as would be required for them to make one revolution in 24 hours about a centrally fixed earth ?
- Query 29.**—How explain the eastward deviation of bodies falling from a great height if the earth has no rotational movement ?
- Query 30.**—How explain the movements of Foucault's gyroscope and swinging pendulum if the earth does not rotate about an axis ?
- Query 31.**—Do not the observed facts of deviating projectiles, of Trade Winds, Ocean Currents, Tides, and the deviation of plumb lines towards the equator, all indicate the rotation of the earth ?
- Query 32.**—How account for the ellipsoidal form of the earth, being flattened at the poles and bulged at the equator, if it does not rotate about an axis passing through its poles ?
- Query 33.**—How is the change of seasons explained if the earth has no annual orbital movement about the sun ?

- Query 34.—Does not the observed fact of the annual parallax of the stars prove conclusively that the earth has an annual orbital movement about the sun ?
- Query 35.—What about the discovery of the aberration of light ? Does not this observed fact prove that the earth has an actual bodily movement through space ?
- Query 36.—If the spectroscope shows that the velocity of light from stars has a certain variation through a period of six months, does not this indicate that the earth itself is approaching or receding from these stars at different times of the year ?
- Query 37.—How account for the discrepancy between the predicted and actual times of eclipses of Jupiter's moons, if the earth does not move round the sun in an orbit having a diameter of approximately 186,000,000 miles ?

PART IV.

On the Evidence in Support of the Hollow Globe Conception.

- Query 38.—What **tangible** evidence do you produce in support of the idea that the earth is a hollow globe ?
- Query 39.—What observations have you made of the mirror-like space which you say is seen **beyond and above** the apparent horizon ?

- Query 40.—May not this mirror-like space be explained as an optical illusion or mirage ?
- Query 41.—What observations have you made to show that distant objects can be seen with the eye considerably below the elevation required by the convex theory ?
- Query 42.—May not the apparent “elevating” of distant objects be due to atmospheric refraction ; for the same reason that the setting sun is seen for several minutes after it has actually passed below the observer’s horizon ?
- Query 43.—What experiments have been made to show that plumb lines converge upwards and not downwards ?
- Query 44.—How does the Rectilineator show the concavity of the earth’s surface ?
- Query 45.—What experiments have been performed with the Rectilineator ?
- Query 46.—Why have these **Tangible** proofs of the earth’s concavity never been investigated by scientists ?
- Query 47.—What **Theoretical** proofs are maintained in support of the hollow globe conception ?
- Query 48.—What is the mechanical superiority of a hollow sphere over a solid one ?
- Query 49.—What economical advantages has the hollow globe arrangement over the old system ?
- Query 50.—What is the general experience of aeronauts when ascending above the earth’s surface ?

- Query 51.—What evidence is there from solar and terrestrial phenomena to show that the sun and earth must be more closely related than the present theoretical distance of 93 million miles will allow?
- Query 52.—What evidence may we derive from the sun-spots?
- Query 53.—What is the electron theory, and what evidence does it furnish in support of a hollow globe idea?
- Query 54.—How may gravitation be explained?
- Query 55.—What evidence is furnished by the discovery of radium?
- Query 56.—Does the observed radio-activity of material substances support the hollow globe idea?
- Query 57.—What is the scientist's conception of the origin and constitution of matter?
- Query 58.—Taking all our evidence from modern researches in Physics, Chemistry, Geology, Astronomy, etc., what must be the probable explanation of the universe?

PART V.

On Some Questions Involved.

- Query 59.—If the human family lives on the inner surface of a hollow globe, having the sun at or near its center, what, then, is the cause of day and night?
- Query 60.—If the earth has an internal diameter of only 8,000 miles, how can it possibly enclose all the heavenly bodies which astronomers tell us are at such enormous distances from us?

- Query 61.—Our comparatively near luminary, the moon, has been subjected to very careful methods of triangulation and observation, and its distance of practically 240,000 miles from us has been determined with a pretty fair degree of accuracy. How is this difficulty of putting the moon inside a hollow earth, only 8,000 miles in diameter, to be met ?
- Query 62.—Likewise the distance of the sun from the earth, having always been considered the unit of all celestial measurements, has been the subject of very careful investigation. How is it conceivable that astronomers have incorrectly determined this distance of 93 million miles ?
- Query 63.—If the sun and moon are both enclosed in a hollow earth, what is the cause of lunar eclipses ?
- Query 64.—What are the stars ?
- Query 65.—What becomes of all the phenomenal results of spectroscopic observations of stars, double stars, nebulae, etc., if they are comparatively insignificant luminous points of light inside the hollow earth ?
- Query 66.—If the Copernican system is not true, how do you account for the exactness with which astronomers are able to predict eclipses and other celestial events ?
- Query 67.—If the earth is stationary, how account for the many terrestrial phenomena such as tides, ocean currents, Foucault's swinging pendulum, etc.?

Query 68.—If the earth is an immense hollow globe only 8,000 miles in diameter, and we are on its inner surface why are we not able with our powerful telescopes to see across it?

Query 69.—What is the nature of the earth's shell?

Query 70.—What supports the earth?

Query 71.—The Bible always speaks of "the heavens and the earth" as being created together in the beginning; they must therefore be co-existent. In the new conception where are the "heavens" in relation to the "earth"?

Query 72.—Are the planets inhabited?

Query 73.—Are the heavens and earth eternal?

Query 74.—What is outside the earth?

Query 75.—What problems remain to be solved by future investigators?

APPENDIX D.

Brief Outline History of Astronomy. *

The Egyptians cultivated astronomy from a remote antiquity—11,000 years ago, according to Herodotus. Diodorus states that they were able to calculate eclipses. Their year, consisted of 365 days.

The Chaldeans are said to have made observations reaching back to 2200 B.C. They learned to predict eclipses by means of their discovery of the eighteen year cycle, called the Saros : similar series of eclipses recur in successive cycles.

The Hindoos seem to have possessed an extensive knowledge of astronomy in olden times, but the dates of their writings are very uncertain.

The Chinese refer the beginning of their astronomical observations to a date about 3000 B.C. About 2600 B.C, the emperor Hoang Ti established a mathematical tribunal for the purpose of correcting the calendar and predicting eclipses. Their records after 720 B.C. seem to be authentic. They contain accounts of eclipses and of remarkable comets.

B.C. 640-548 Thales, the chief of the Seven Sages, flourished. He was the founder of the Greek school of Astronomy ; he taught that the moon receives its light from the sun, while the stars are self-luminous ; he believed that the earth was a sphere.

* Taken largely from Howe's "Elements of Descriptive Astronomy."

B.C. 569-470. Pythagoras, of Samos, is reputed to have taught his disciples that the earth was not the center of the universe, but that there was a central fire about which the sun, moon, earth, planets, and stars revolved.

B.C. 433. Meton, an Athenian, discovered the "Metonic Cycle," which is still used in finding the time of Easter. The cycle embraces 235 synodic months, which are almost exactly equal to 19 years of $365\frac{1}{4}$ days each. This cycle is also of use in predicting eclipses.

B.C. 190-120. Hipparchus, of Nicea in Bithynia, did the memorable work which has given him the appellation of the Father of Astronomy. He was the first to use right ascensions and declinations, and made the earliest catalogue of stars. He devised the method of locating places on the earth by latitude and longitude, discovered the precession of the equinoxes, calculated eclipses, divided the day into periods of twelve hours each, and determined the periods of the planets.

A.D. 100-170. Ptolemy, the Alexandrian astronomer, produced a number of astronomical and geographical works, the most celebrated of which is now known as the *Almagest*, a name given by the Arabians. The theory of the celestial motions which he advocated is known as the Ptolemaic theory, and enthralled astronomers for 1,400 years. It placed the earth, a motionless sphere, in the center of the universe, which revolved about it.

A.D. 1214-1294. Roger Bacon laid the foundations of the modern experimental method in science, afterwards

elaborated by Francis Bacon : he was a conspicuous champion of intellectual liberty.

A.D. 1543. The great work of Copernicus, entitled *De Revolutionibus Orbium Celestium*, was published. This work set forth the theory that the sun is the center of the solar system. The theory gained acceptance only after a sturdy battle with the adherents of the Ptolemaic system, which had been generally believed for fourteen centuries.

A.D. 1576. Tycho Brahe, a Dane, rejected the Copernican theory, retained the earth as the center of the universe, made the sun revolve about the earth, and the planets about the sun. The instruments which he employed in his observations were much more accurate than any others that had ever been constructed.

A.D. 1610. Galileo, of Pisa, invented the telescope, which revealed the moons of Jupiter, mountains on the moon, the phases of Venus, etc.

A.D. 1609. Kepler published his laws of planetary motions.

A.D. 1687. Newton published the *Principia*, universally conceded to be the masterpiece of the world's scientific thought.

A.D. 1705. Halley predicted that the Great Comet of 1682 would return in 1759.

A.D. 1727. Bradley, an English astronomer, discovered the aberration of light.

A.D. 1781. Hadley invented the sextant, which has proved invaluable to mariners.

A.D. 1781. Sir William Herschel discovered the planet Uranus.

A.D. 1801. Piazzi, of Palermo, discovered Ceres, the first minor planet.

A.D. 1840. The moon was first photographed by Dr. J. W. Draper, of New York.

A.D. 1846. The planet Neptune was discovered : this is esteemed the greatest triumph of mathematical analysis.

A.D. 1859. Spectrum analysis, which has lately yielded marvellous results, entered the service of astronomy.

A.D. 1868. The sun's prominences were observed by Jansen and Lockyer by means of the spectroscope, in full sunshine : they had hitherto been seen only during total solar eclipses.

A.D. 1877. The satellites of Mars were discovered by Professor Asaph Hall, with the twenty-six inch telescope of the United States Naval Observatory, at Washington.

A.D. 1892. The fifth satellite of Jupiter was discovered by Barnard.

A.D. 1895. Saturn's rings were spectroscopically proved by Keeler to be composed of small bodies. Helium was found to be widely disseminated throughout the universe.

A.D. 1898. The notable asteroid Eros was discovered by Witt, at Berlin.

A.D. 1899. W. H. Pickering announced the discovery of Phœbe, the ninth satellite of Saturn.

A.D. 1900-1. The pressure exerted by solar radiation was measured.

A.D. 1905. The discoveries of the sixth and seventh satellites of Jupiter were announced by Perrine. W. H. Pickering discovered Themis, the tenth satellite of Saturn.

A.D. 1908. Melotte discovered the eighth satellite of Jupiter.

A.D. 1917. A series of observations of phenomena at the earth's surface resulted in the revolutionary discovery that the earth's surface is concave, instead of convex. A new era of science inaugurated.

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